# Hotwire® Shelf Concentration Module (SCM) Card

## User's Guide

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January 2001

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# About This Guide

## Document Purpose and Intended Audience

This guide describes how to configure, operate and troubleshoot the software component of the Shelf Concentration Module (SCM) card. This guide incorporates features in the SCM software version 2.1.

When the SCM card is used in a Hotwire 8820 GranDSLAM chassis, it aggregates DSL traffic from each of the DSL port cards with an ATM interface in the chassis on the chassis' backplane bus and concentrates it onto a WAN ATM uplink.

Use this guide to:

- Obtain a basic understanding of the SCM card's functionality
- Understand how to configure, monitor, and troubleshoot the SCM card
- Configure VCC between an ATM uplink and port cards in the Hotwire GranDSLAM

This guide is intended for administrators and operators who maintain the networks that support Hotwire network operations. A basic understanding of internetworking protocols and their features is assumed. Specifically, you should have familiarity with Simple Network Management Protocol (SNMP), Network Management Systems (NMSs), and the following internetworking concepts:

- ATM technology
- TCP/IP applications
- IP routing (also referred to as IP forwarding)

It is assumed that you have already installed the Hotwire 8820 GranDSLAM and the Management Communications Processor (MCP) card. If you have not done so already, refer to the appropriate Hotwire chassis installation guide for installation instructions.

**NOTE:**

You should use this document in conjunction with the appropriate DSL Card User's Guide. These documents provide information about specific DSL cards you have installed in the Hotwire chassis. See *Product-Related Documents*.

# Document Summary

| **Section** | **Description** |
|---|---|
| Chapter 1, *About the SCM Card* | Provides an overview of the features and functionality of the Hotwire SCM card. |
| Chapter 2, *Menus and Screens* | Provides an overview of the menus and screens used by the Hotwire SCM card. |
| Chapter 3, *SCM Card Setup* | Contains information needed before setting up cross connections and traffic profiles. |
| Chapter 4, *Configuration Menu Options* | Provides step-by-step instructions for each option on the Configuration Menu. Use these options to customize the SCM card. |
| Chapter 5, *Monitoring Menu Options* | Provides step-by-step instructions for each option on the Monitoring Menu. Use these options to monitor the SCM card. |
| Chapter 6, *Diagnostics Menu Options* | Provides step-by-step instructions for each option on the Diagnostics Menu. Use these options to perform diagnostic functions. |
| Appendix A, *Troubleshooting* | Lists suggested troubleshooting steps for use when traffic to/from an ATM SDSL cell port card does not flow as expected. |
| Appendix B, *Port Mapping Table* | Lists the default VPI/VCI values assigned to circuits on the port card and the SCM card for user data (UBR) and user voice (rt-VBR) service. |
| *Glossary* | Defines acronyms and terms used in this document. |
| *Index* | Lists key terms, acronyms, concepts, and sections in alphabetical order. |

# Product-Related Documents

| **Document Number** | **Document Title** |
|---|---|
| 5020-A2-GN10 | *Hotwire POTS Splitter Central Office Installation Instructions* |
| 5030-A2-GN10 | *Hotwire 5030 POTS Splitter Customer Premises Installation Instructions* |
| 5038-A2-GN10 | *Hotwire 5038 Distributed POTS Splitter Customer Premises Installation Instructions* |
| 5620-A2-GN10 | *Hotwire 5620 RTU Customer Premises Installation Instructions* |
| 6310-A2-GN10 | *Hotwire 6310 MVL Modem with Inline Phone Filter Installation Instructions* |

| **Document Number** | **Document Title** |
|---|---|
| 6301-A2-GN10 | *Hotwire 6301/6302 IDSL Router Installation Instructions* |
| 6341-A2-GN10 | *Hotwire 6341/6342 Symmetric DSL Router Installation Instructions* |
| 6371-A2-GB20 | *Hotwire DSL Routers User's Guide* |
| 6371-A2-GN10 | *Hotwire 6371 RADSL Router Installation Instructions* |
| 7800-A2-GZ41 | *OpenLane 5.x Service Level Management for UNIX Quick Start Installation Instructions* |
| 7800-A2-GZ42 | *OpenLane 5.x Service Level Management for Windows NT Quick Start Installation Instructions* |
| 8000-A2-GB22 | *Hotwire Management Communications Controller (MCC) Card, IP Conservative, User's Guide* |
| 8000-A2-GB25 | *Hotwire 8100/8200 Interworking Packet Concentrator (IPC) Network Configuration Guide* |
| 8000-A2-GB26 | *Hotwire MVL, ReachDSL/MVL, RADSL, IDSL, and SDSL Cards, Models 8310, 8312/8314, 8510/8373/8374, 8303/8304, and 8343/8344, User's Guide* |
| 8000-A2-GB29 | *Hotwire Management Communications Controller (MCC) Card User's Guide* |
| 8000-A2-GB90 | *Hotwire 8100/8200 Interworking Packet Concentrator (IPC) User's Guide* (Feature No. 8200-M2-901) |
| 8000-A2-GZ40 | *Hotwire MCC Card, IP Conservative, Installation Instructions* |
| 8021-A2-GZ40 | *Hotwire Shelf Concentration Module (SCM) Card Installation Instructions* |
| 8303-A2-GZ40 | *Hotwire 8303/8304 IDSL Card Installation Instructions* |
| 8335-A2-GB20 | *Hotwire ATM Line Cards, Models 8335 and 8365, User's Guide* |
| 8335-A2-GZ40 | *Hotwire ATM Line Cards, Models 8335 and 8365, Installation Instructions* |
| 8343-A2-GZ40 | *Hotwire 8343/8344 SDSL Card Installation Instructions* |
| 8820-A2-GN20 | *Hotwire 8820 GranDSLAM Installation Guide* |

Contact your sales or service representative to order additional product documentation.

Most Paradyne documents are also available on the World Wide Web at **www.paradyne.com**. Select *Library → Technical Manuals*.

# About the SCM Card

# 1

## Overview

The Hotwire® Shelf Concentration Module (SCM) is a circuit card assembly (CCA) that contains a parentcard with an Asynchronous Transfer Mode (ATM) switch, backplane interfaces, a processor, cell Segmentation Assembly/Reassembly (SAR), and an uplink childcard. The childcard determines the type of ATM uplink supported by the SCM.

The SCM card is used in a Hotwire 8820 GranDSLAM (Digital Subscriber Line Access Multiplexer) chassis to aggregate DSL traffic from each of the DSL port cards with an ATM interface in the chassis from the chassis' backplane bus and concentrate it onto an ATM WAN uplink interface. The model number of the SCM card differs, depending on what type of ATM uplink childcard is being used.

| SCM Card Model | ATM Uplink Childcard |
|---|---|
| 8021 | DS3 |
| 8022 | OC3 with multi-mode fiber (2 km) |
| 8023 | OC3 with single-mode fiber for intermediate reach (15 km) |
| 8024 | OC3 single-mode fiber for long reach (40 km) |
| 8025 | E3 |
| 8026 | DS1 Inverse Multiplexing for ATM (IMA) |
| 8027 | E1 IMA (75 ohm) |
| 8028 | E1 IMA (120 ohm) |

# Features

The SCM card provides these features:

- **Configuration**

  Configure the SCM card for operation in your system.

- **Monitoring**

  Monitor the activity of the SCM card.

- **Diagnostics**

  Diagnose Uplink and card problems, perform and review results of tests (including power-on self-test).

- **Device and Test Monitoring**

  Provide device status, activate alarm indicators, log system errors, measure performance capabilities.

- **Asynchronous Terminal Interface (ATI)**

  A menu-driven VT100-compatible interface.

- **Primary Network Management Support via SNMP**

  Primary network management support through an SNMP agent for configuring, monitoring, and sending traps.

- **Alarm Indications**

  Faceplate LEDs provide general card status. User interface screens are also provided.

- **Non-Volatile Database Storage**

  Non-volatile database storage for configuration options and VC cross connections.

- **Control**

  Firmware download, configuration upload and download.

- **Traffic Congestion Management**

  The SCM card can regulate traffic placed on its uplink to provide guaranteed or fair access to the uplink bandwidth for a variety of services (voice, data, etc.). Uplink Bandwidth Reservation allows you to specify the fraction of bandwidth reserved for various traffic classes. Bandwidth utilization allows a percentage of excess usage (oversubscription) to be used by the Connection Admission Control (CAC) function when admitting new connections.

- **Management Bridge**

  Provides the capability of managing an external device connected to the SCM card’s Ethernet port, in addition to inband management capabilities already present in the Hotwire GranDSLAM.

# Levels of Access

There are two levels of diagnostic/administrative access to the user interface of the entire Hotwire GranDSLAM via a terminal or Telnet session:

- **Administrator**

  The Administrator has complete read/write access to all cards in the chassis. With this access level you can set specific parameters and variables to configure the SCM card.

- **Operator**

  The Operator has read-only access to all cards in the chassis. With this level of access you can view card status, physical layer status, interfaces, uplink and ATM statistics.

Access levels are configured via the Users Account screen on the MCP card. The default access is Administrator access privileges with no login and no password. To provide login security to the SCM card, at least one Administrator account must be configured. See the *Hotwire Management Communications Controller (MCC) Card, IP Conservative, User's Guide*.

# Software Functionality

Software functionality is provided through menu selections that are summarized below. For details on the menu hierarchy, see *Hotwire – SCM Menu* in Chapter 2, *Menus and Screens*.

## SCM Configuration Menu

The SCM Configuration Menu provides access to the following information to configure:

- SCM card information
- Uplink parameters
- Inband management (when this feature is selected on the MCP card)
- ATM parameters
- Cross Connects
- Traffic Profiles

**NOTE:**

You must have Administrator permission to configure the system. For more information about configuring the system, see Chapter 4, *Configuration Menu Options*.

## SCM Monitoring Menu

The SCM Monitoring Menu provides access to the following information to display:

- Status of active card interfaces
- Cross connections
- Traffic parameters
- ATM parameters and statistics
- Uplink parameters and statistics
- Inband management statistics

The monitoring screens gather pertinent information and isolate potential problem areas. You can monitor the system with either Administrator or Operator permission. For more information, see Chapter 5, *Monitoring Menu Options*.

## SCM Diagnostics Menu

The SCM Diagnostics Menu provides options to:

- Display self-test results for SCM card and uplink
- Show major and minor alarms for SCM card.
- Display diagnostic information for ATM, uplink, or inband management
- Perform Diagnostic Loopbacks

For more information, see Chapter 4, *Configuration Menu Options*.

**NOTE:**

You must have Administrator permission to perform most diagnostic activities. For more information, see Chapter 6, *Diagnostics Menu Options.*

# Menus and Screens

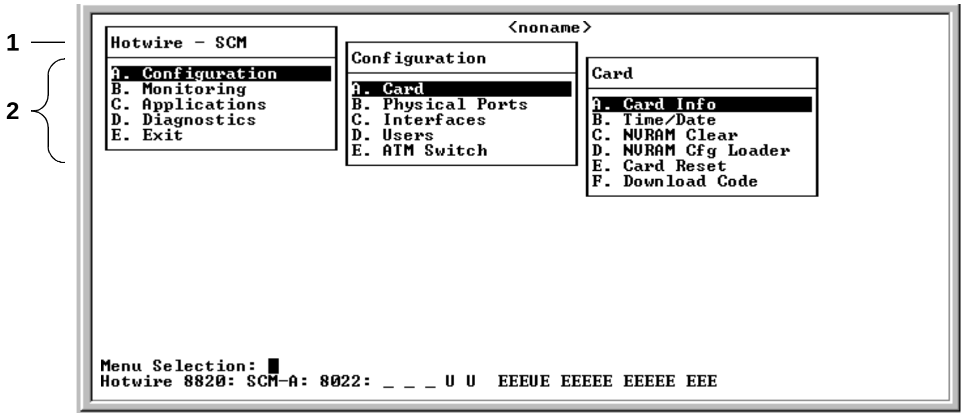
# 2

## Formats

The Hotwire SCM user interface has ASCII text menus and screens.

### Menu Components

A typical SCM menu screen looks like this:



```
Menu Selection: █
Hotwire 8820: SCM-A: 8022: _ _ _ U U   EEEUE EEEEE EEEEE EEE
```

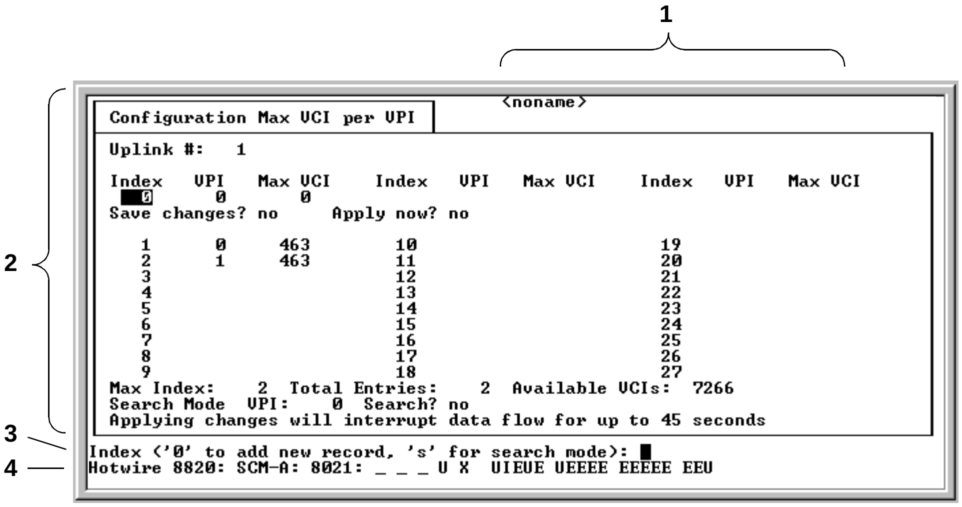
1. **Menu Title** is the top line of the boxed menu. It displays the title of the menu or submenu.
2. **Menu List** (below the boxed title) displays the list of menu options. When selected, a menu option usually displays a submenu window or screen. If no submenu is shown, an input (or information) screen appears.

Alphabetical navigation keys precede each menu selection (e.g., **A. Configuration**). These keys provide a convenient way to select menu items. For example, from the menu above, you press the **A** key to select the Configuration menu. The Configuration menu appears. You then press the **A** key to select the Card menu. The Card menu appears.

See *Navigation Keys* on page 2-4 for more information.

## Screen Components

A typical SCM input screen looks like this:



```
                                         <noname>
 Configuration Max VCI per VPI
 Uplink #:   1

 Index   VPI   Max VCI    Index   VPI   Max VCI    Index   VPI   Max VCI
    0      0       0
 Save changes? no     Apply now? no

    1      0     463        10                        19
    2      1     463        11                        20
    3                       12                        21
    4                       13                        22
    5                       14                        23
    6                       15                        24
    7                       16                        25
    8                       17                        26
    9                       18                        27
 Max Index:    2  Total Entries:    2  Available VCIs:  7266
 Search Mode  VPI:    0  Search? no
 Applying changes will interrupt data flow for up to 45 seconds
Index ('0' to add new record, 's' for search mode): █
Hotwire 8820: SCM-A: 8021: _ _ _ U X  UIEUE UEEEE EEEEE EEU
```

1. **System Header Line** is the top right line of the screen. This field displays the chassis or individual card name, e.g. SCM. If you have not defined the system name, **<no name>** appears. This information is entered on the Card Info screen (**A-A-A**).

2. **Display Area** is the main body of the screen. This area contains the screen name in a "tab'' at the upper left, and fields displaying data and/or requiring input. The input values themselves are entered in the Input Line at the bottom of the screen (**Index:** in the screen above).

3. **Input Line** is in the lower area of the screen. This area displays prompts after which you enter values for the field highlighted in the Display Area.

4. **Status Line** is the last line of the screen. It displays status about the selected card and all interfaces. The status line alternates information each time that the screen is refreshed. For example, in the previous illustration, the following line is displayed:

```
Hotwire 8820: SCM-A: 8021: _ _ _ U X U UIEUE UEEEE EEEEE EEU
```

| Display | Description |
|---|---|
| Hotwire 8820 | Chassis type |
| SCM-A | SCM card in Slot A |
| 8021 | Model number of selected card (8021, 8022, 8023, etc.) |
| _ | Test mode. Card currently in test mode (T) or _ for no active test. |
| _ | Major alarm. Major alarm present on card (M) or _ for no active major alarm. |
| _ | Minor alarm. Minor alarm present on card (R) or _ for no minor alarm active. |
| U | Uplink status:<br>D=Down, L=Loopback, U=Up, X=Disabled/Not Initialized |
| X U | Status of the internal (Eth1) and external (Eth2) Ethernet ports:<br>D=Down, U=Up, X=Disabled/Not Initialized |
| UIEUE UEEEE EEEEE EEU | Physical status of the slot (maximum 18 slots):<br>■ A=Alarm. A port card compatible with the SCM card is in the slot, but it is not operating correctly.<br>■ E=Empty slot<br>■ I=Incompatible port card. The slot contains a port card that is incompatible with SCM card operation (for example, a port card with an Ethernet interface).<br>■ U=Up. A port card compatible with the SCM card is in the slot and is operating correctly. |

# Navigation Keys

| **Keys** | **Definition** |
|---|---|
| Backspace, Del, Ctrl-d | Erases the character to the left of the prompt. |
| Ctrl-e | Returns to the card selection screen from any screen. |
| Ctrl-r | Resets counters (on monitoring statistics displays). |
| Ctrl-u | Clears the current input or prompt line. |
| Ctrl-v | Displays pop-up menus. |
| Esc h, ? | Displays the online Help screen. |
| Esc l, Ctrl-l | Refreshes the screen. |
| Esc n | Goes to the next window. |
| Esc p, Ctrl-z | Goes back to the previous window. |
| Esc t, Ctrl-a, Ctrl-c, Ctrl-t, or Ctrl-y | Goes back to the original, top-level window. |
| Left arrow, Ctrl-b | Moves the cursor to the left. |
| Right arrow, Ctrl-f | Moves the cursor to the right. |
| Up arrow, Ctrl-p | Moves up to the previous menu selection or entry field. |
| Down arrow, Ctrl-n | Moves down or to the next selection. |
| Enter or Return | Accepts entry. |

## Navigation Keys for Pop-Up Windows

| **Keys** | **Definition** |
|---|---|
| Ctrl-c or Ctrl-z | Exits pop-up menu without accepting entry. |
| Ctrl-n or Down Arrow | Moves down one menu item. |
| Ctrl-p or Up Arrow | Moves up one menu item. |
| Ctrl-v | Displays pop-up menu. |
| Ctrl-w | Scrolls up one page. |
| Ctrl-x | Scrolls down one page. |

# Accessing the System

Access the system via the User Login screen. This screen only appears if you have configured your DSL system and set up accounts on the Configure Accounts screen. See the *Management Communications Controller (MCC) Card, IP Conservative, User's Guide* for login information.

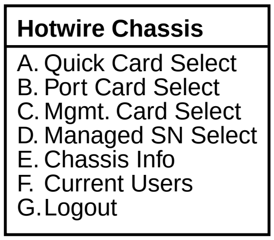
For an external Ethernet connection, if there is no BOOTP server on the Ethernet LAN to which the MCP is connected, the initial configuration must be done from the console port.

For an internal Ethernet management connection, you must do the following:

1. On the MCP card, assign an IP address to the MCP card's internal interface (see the *Management Communications Controller (MCC) Card, IP Conservative, User's Guide*).
2. On the MCP card, configure the MCP card for Internal (see the *Management Communications Controller (MCC) Card, IP Conservative, User's Guide*)
3. On the SCM card, configure the uplink inband management's VPI/VCI (**A-C-A**).

## Accessing the SCM Card from the Hotwire Chassis Main Menu

The Hotwire Chassis Main Menu is shown below.



From the Hotwire Chassis Main Menu, you can select the SCM card from:

- **A. Quick Card Select** to display a list of all cards in the chassis. Enables you to Telnet to a selected SCM, MCC, or DSL card in the chassis or to a connected DSL Router (e.g., 6371 RADSL), providing you know the port on the DSL card to which the endpoint is connected. The card you select determines the next Hotwire menu. Only those slots that are populated are displayed; empty slot numbers are skipped. If more than 17 slots are populated, 15 cards will display on a first page, with the remaining slots displaying on a second page. Also provides status on the card interfaces. After selecting a card, you can return to the Quick Card Select screen by pressing Ctrl-e or selecting Exit from the menu.

  **NOTE:**

  If a card is locked in Download Only mode, you will be informed of this and no status will display on the screen.

- **C. Mgmt. Card Select** to display all MCC-type and SCM management cards in the chassis. Enables you to Telnet to a selected management card or SCM card in the chassis. Also provides status on all management cards and their interfaces. After selecting a card, you can return to the Mgmt. Card Select screen by pressing Ctrl-e or selecting Exit from the menu.

## Accessing a Selection Screen

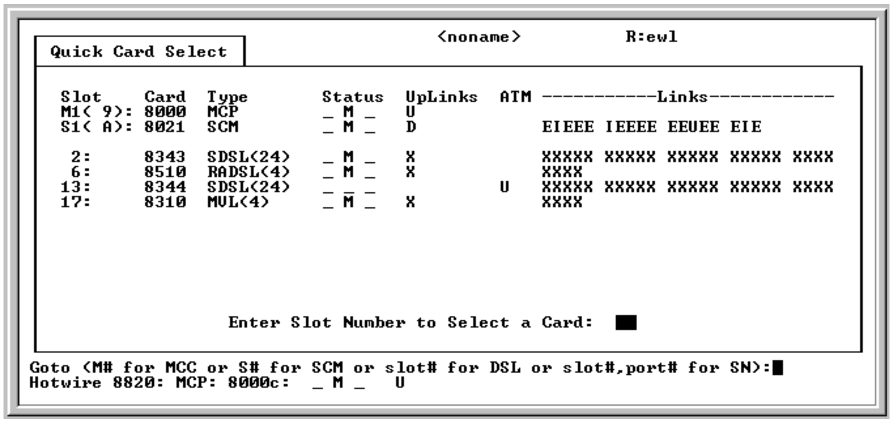
### ▶ Procedure

To access one of the Selection screens:

1. From the Hotwire Chassis Main Menu, select one of the following:
   - — **A** for Quick Card Select
   - — **B** for Port Card Select (does not apply for SCM card)
   - — **C** for Mgmt. Card Select
   - — **D** for Managed SN Select (does not apply for SCM card)
2. At the **`Goto:`** prompt, type either the slot number of the desired card or the slot and port number of the desired SN.

   The appropriate menu appears. For port card menu information, see the appropriate Port Card User's Guide. For MCC card menu information, see the *Management Communications Controller (MCC) Card, IP Conservative, User's Guide.* For SN menu information, see the *Hotwire DSL Routers User's Guide*.

   The following is an example of the Quick Card Select screen.



```
                                       <noname>          R:ewl
  Quick Card Select

   Slot    Card  Type       Status  UpLinks  ATM -----------Links------------
   M1( 9): 8000  MCP        _ M _   U
   S1( A): 8021  SCM        _ M _   D            EIEEE IEEEE EEUEE EIE

    2:     8343  SDSL(24)   _ M _   X            XXXXX XXXXX XXXXX XXXXX XXXX
    6:     8510  RADSL(4)   _ M _   X            XXXX
   13:     8344  SDSL(24)   _ _ _            U   XXXXX XXXXX XXXXX XXXXX XXXX
   17:     8310  MVL(4)     _ M _   X            XXXX




                   Enter Slot Number to Select a Card: ██

Goto (M# for MCC or S# for SCM or slot# for DSL or slot#,port# for SN):█
Hotwire 8820: MCP: 8000c:  _ M _   U
```

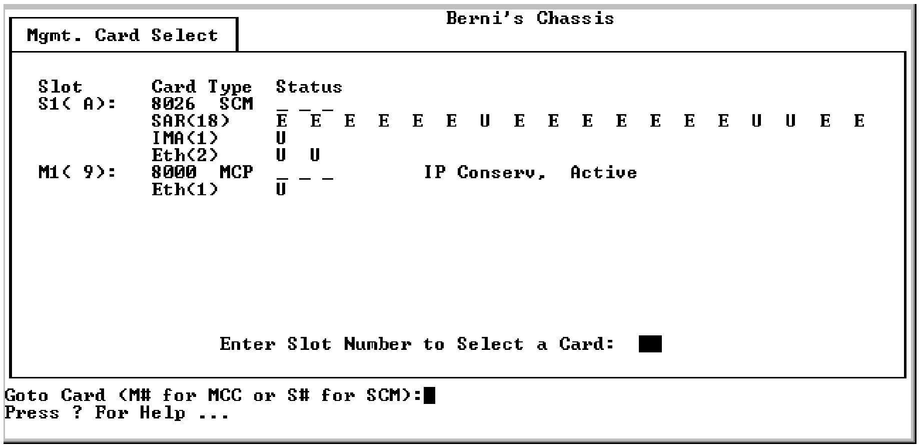
## NOTE:

If an option is not active, an underscore appears in its place.

The following information is displayed on the Quick Card Select screen.

| **Column Heading** | **Display** | **Description** |
|---|---|---|
| Slot | <slot number> | Slot number of card in chassis. |
| Card | <model number> | Model number of card such as 8510, 8312, 8343, etc. |
| Type | SCM, RADSL, MVL, SDSL, etc. (1–24) | Card type (number of ports), for example MVL(12). |
| Status | Position 1: T or _ | Test mode. Card currently in test mode or _ for no active test. |
| | Position 2: M or _ | Major alarm. Major alarm present on card or _ for no active major alarm. |
| | Position 3: R or _ | Minor alarm. Minor alarm present on card or _ for no minor alarm active. |
| Uplinks | <uplink status> | Status of uplink:<br>U=Up, D=Down, X=Disabled/Not Initialized, L=Loopback, A=Alarm |
| ATM | <atm status> | Status of ATM uplink between cell port card and SCM:<br>U=Up, D=Down |
| Links | <dsllink status> | Status of DSL ports:<br>U=Up, D=Down, X=Disabled/Not Initialized, L=Loopback, E=Empty slot, I=Incompatible slot, H=Handshaking, N=Network timing |

The following is an example of the Mgmt. Card Select screen.



```
 Mgmt. Card Select                   Berni's Chassis

   Slot      Card Type  Status
   S1( A):   8026  SCM  _ _ _
             SAR(18)    E  E  E  E  E  E  U  E  E  E  E  E  E  E  U  U  E  E
             IMA(1)     U
             Eth(2)     U  U
   M1( 9):   8000  MCP  _ _ _        IP Conserv,  Active
             Eth(1)     U



                  Enter Slot Number to Select a Card:

Goto Card (M# for MCC or S# for SCM):
Press ? For Help ...
```

**NOTE:**

If an option is not active, an underscore appears in its place.

The following information is displayed on the Mgmt. Card Select screen.

| Column Heading | Display | | Description |
|---|---|---|---|
| Slot | S1<slot number> | | SCM card and slot number (A). |
| Card Type | <card type> | | Management card model number (8021) and card type (SCM). |
| Status (1st line) | Position 1: T or _ | | Test mode. Card currently in test mode or _ for no active test. |
| | Position 2: M or _ | | Major alarm. Major alarm present on card or _ for no active major alarm. |
| | Position 3: R or _ | | Minor alarm. Minor alarm present on card or _ for no minor alarm active. |
| Status (2nd line) | <status> | A, E, I or U | Physical status of the slot:<br>A=Alarm, E=Empty slot, I=Incompatible port card, U=Up |
| Status (3rd line) | <status> | D, L, or U | Uplink status:<br>D=Down, L=Loopback, U=Up, X=Disabled/Not Initialized |
| Status (4th line) | <status> | D, U, or X | Internal Ethernet (Eth1) uplink status for inband management and External Ethernet (Eth2) status:<br>D=Down, U=Up, X=Disabled/Not Initialized |

For example, the following may be displayed on the Mgmt. Card Select screen:

```
Line 1:    S1(A):8026 SCM _ _ _
Line 2:          SAR(18)  E E E E E E U E E E E E E E U U E E
Line 3:          IMA(1)   U
Line 4:          ETH(2)   U U
Line 5:    M1(9):8000 MCP _ _ _
Line 6:          ETH(1)   U _

Position:                 1 2 3
```

Lines 1 and 5 show the following:

- There is an SCM card in Slot A and an MCP card in Slot 9
- Position 1 – No current test ( _ )
- Position 2 – No major alarm is present ( _ )
- Position 3 – No minor alarm present ( _ )

Line 2 shows that there are 18 SAR interfaces (one for each slot in the Hotwire GranDSLAM).

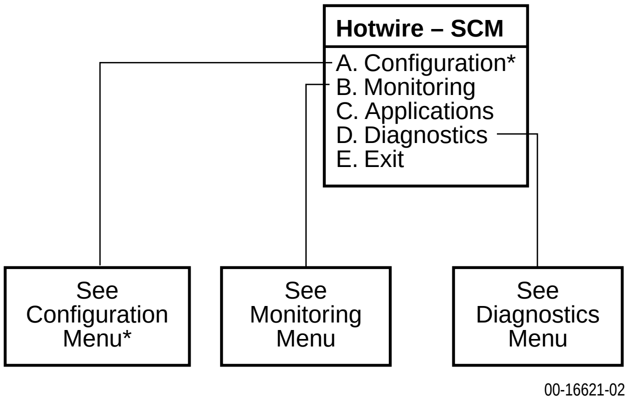
Line 3 shows that there is an IMA interface.

Lines 4 and 6 show that there is an Ethernet interface configured for the SCM and MCP cards with Position 1 displaying the internal Ethernet status and Position 2 displaying the external Ethernet status.

## Hotwire – SCM Menu

After selecting the SCM card from either the Quick Card Select screen or the Mgmt. Card Select screen, the system displays the Hotwire – SCM Menu.

From this menu you configure, monitor, run applications, and diagnose the SCM card.



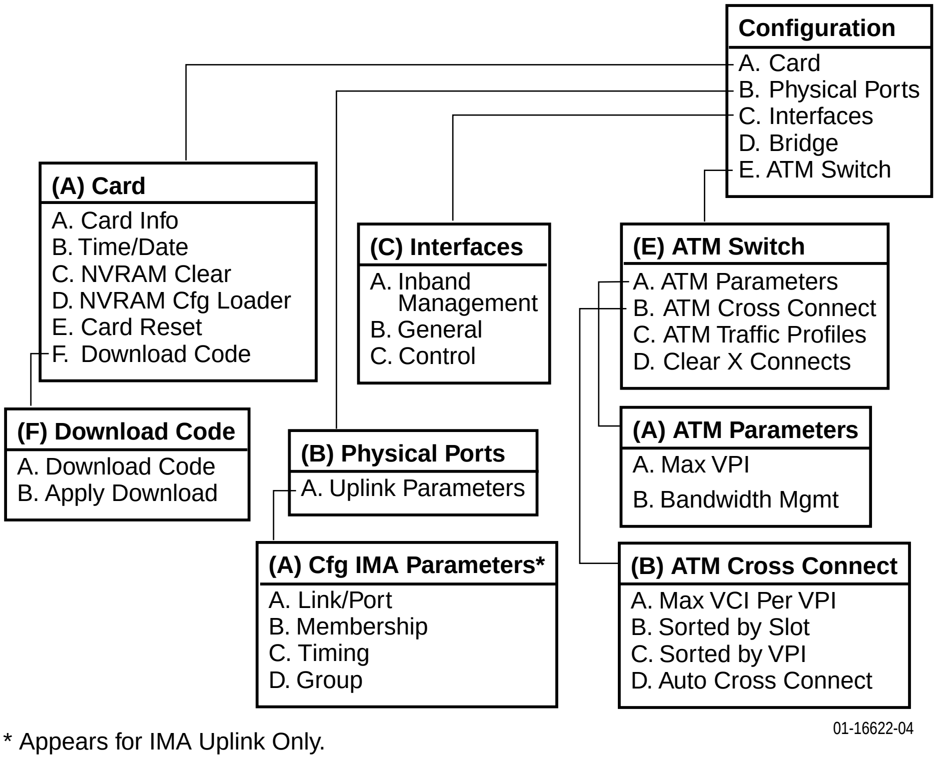
* The Configuration menu item appears only if you have Administrator permission.

## Configuration Menu

The following figure illustrates the complete Configuration menu hierarchy selected from the Hotwire – SCM menu.

### NOTE:

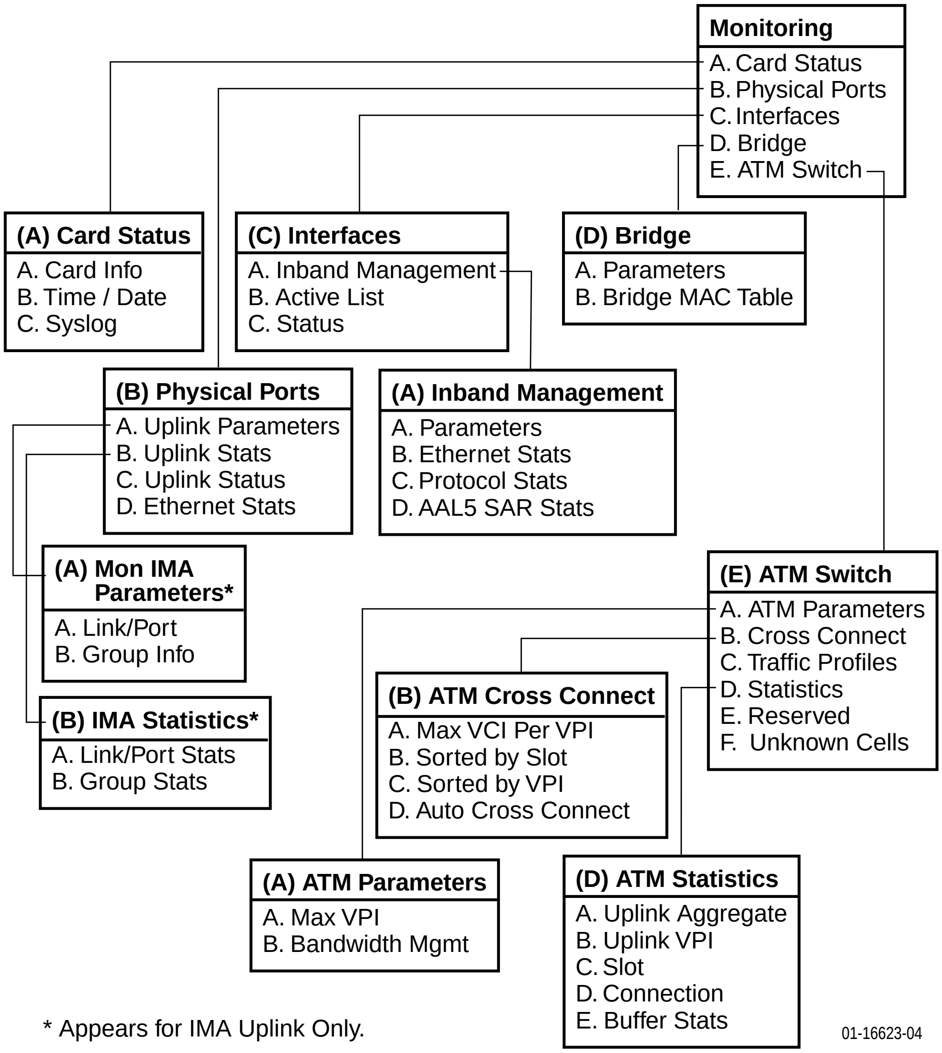
The Configuration Menu selection only appears if you log in to the system with a user account that has Administrator permission.



* Appears for IMA Uplink Only.

## Monitoring Menu

The following figure illustrates the complete Monitoring Menu hierarchy selected from the Hotwire – SCM Menu.



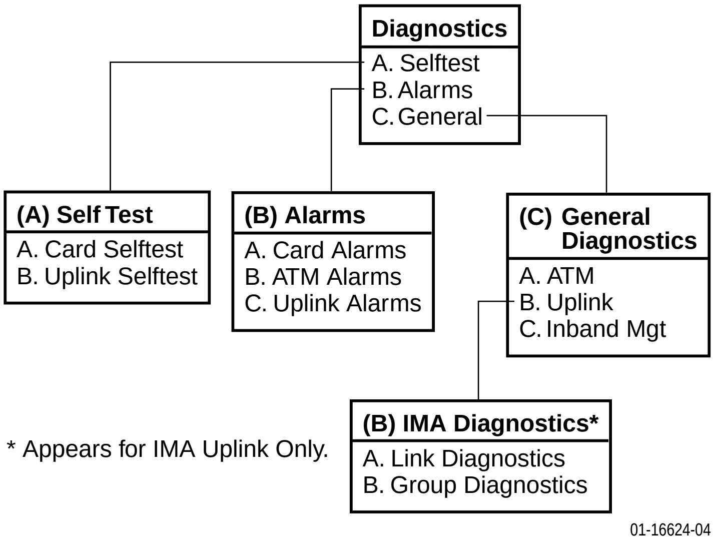
* Appears for IMA Uplink Only.

## Applications Menu

The Applications menu is not used.

## Diagnostics Menu

The following figure illustrates the complete Diagnostics Menu hierarchy selected from the Hotwire – SCM Menu.



## Chassis Information Screen

From the Hotwire Chassis Main Menu, select **E. Chassis Info** to access the Chassis Information Screen.

| **Field** | **Input Characters** | **Description** |
|---|---|---|
| Chassis Name | 16 alphanumeric | Name for the equipment. |
| Chassis Contact | 32 alphanumeric | Name and phone number of individual responsible for the equipment. |
| Chassis Location | 16 alphanumeric | Physical location of the equipment. |
| Bay Number | 16 alphanumeric | Floor and/or bay number of the equipment. |
| Chassis Number | 16 alphanumeric | Chassis serial number (located on the lower right side of chassis). |
| Chassis Model | 4 alphanumeric | Chassis model number (for example, 8820). The MCC card fills in this field, but you can change it. |

Use care when filling in this information, since the system will react based on the values you enter. Filling in this information results in adding data in the MIB II Systems Group.

After you have made changes, the message **`Configuration has been modified. Save (yes/no)?`** appears. Type **y** or **yes** and press Enter to save changes. The Hotwire Chassis Main Menu appears.

# Exiting the System

You can manually log out of the system or, after five minutes of inactivity, the system automatically logs you out.

## Manually Logging Out

### ▶ Procedure

To exit from the Hotwire DSL system:

1. Select Exit from either the Hotwire – SCM menu.

   The card selection screen appears.

2. Press Ctrl-a.

   The Hotwire Chassis Main Menu appears.

3. Select Logout.

   The system exits from the current session.

## Automatically Logging Off

The DSL system has an automatic timeout feature that logs you out after five minutes of inactivity. You need to log back in to continue your work.

To log back in, press Enter to display the User Login screen and log in.

# SCM Card Setup

# 3

## Overview

You can set up the SCM card for default cross connections, and if needed, custom cross connections. You can also define the traffic profiles for all connections. Use the following procedures in conjunction with Chapter 4, *Configuration Menu Options* to set up the SCM card for use with the DSL port card(s) in the chassis. Appendix B, *Port Mapping Table*, contains a port mapping table showing the default VPI/VCI values assigned to circuits on the ATM SDSL port card and the SCM card for data and voice service.

## Installing the Hotwire GranDSLAM Chassis and Cards

### ▶ Procedure

To install the hardware and create the management path:

1. Install the Hotwire GranDSLAM chassis as described in the *Hotwire 8820 GranDSLAM Installation Guide*.
2. Connect a VT terminal or PC running VT terminal emulation software to the Serial connector on the Hotwire GranDSLAM chassis. See the *Hotwire 8820 GranDSLAM Installation Guide* for more information.
3. Install the MCP card as described in the *Hotwire MCC Card, IP Conservative, Installation Instructions*.
4. Install the SCM card as described in the *Hotwire Shelf Concentration Module (SCM) Card, Installation Instructions*.
5. Configure the management channel connectivity. This includes the MCP card's IP address, and choosing an internal or external management path. See the *Hotwire Management Communications Controller (MCC) Card, IP Conservative, User's Guide*.
   - — If using an external path, connect the external Ethernet cable from connector 9 of the chassis to an Ethernet hub or switch, or to a concentrator (IPC), or directly to a terminal or PC using a crossed Ethernet cable.

- If using an internal path, go to the SCM card Configuration Inband Management screen (**A-C-A**) and choose the VPI/VCI to be used by the inband management channel. (Internal must also be chosen on the MCP card.)

## Setting Up Default Cross Connections

The Hotwire GranDSLAM has powerful default configuration capabilities to minimize configuration required later. Use the following procedure to take advantage of these features prior to activating services from the Hotwire GranDSLAM.

### ▶ Procedure

To set up the SCM card with default connections:

1. Determine the expected services to be deployed from the Hotwire GranDSLAM and identify the attributes of these service offerings (e.g., ATM Class of Service, sustained peak cell rates, subscriber oversubscription targets, etc.).
2. Using the information gathered in Step 1, determine the traffic management strategy for handling congestion in the Hotwire GranDSLAM system and the network (e.g., policing).
3. Select the default profiles to match the predominant service profile using the ATM Traffic Profiles screen (**A-E-C**). See *Creating ATM Traffic Profiles* in Chapter 4, *Configuration Menu Options*, for a list of the default traffic profiles.
4. Configure uplink bandwidth utilization and reservation values for the priority or policy necessary to meet the needs of the intended services. Use the ATM Bandwidth Management screen (**A-E-A-B**).
5. Determine the VPI/VCI numbering strategy. It is recommended for ease of administration and maintenance that default VCs with different traffic profiles be configured on separate VPIs.
6. Based on the intended services, determine what type of port cards will be installed in the chassis and how many default connections they require:
   - Packet port cards require one default VC per port of type data.
   - Cell port cards (e.g., ATM SDSL) default to two VCs per port of type data and voice.
   - TDM port cards (e.g., TDM SDSL) do not use the SCM and require no default VCs.
   - Ethernet-based packet port cards do not use the SCM and require no default VCs.

7. Use the SCM card's Automatic Cross Connects screen (**A-E-B-D**) to configure the VPI and starting VCI numbers for each channel (set of default configurations). The defaults for each channel are:

   — Channel 0: VPI = 0, starting VCI = 32

   — Channel 1: VPI = 1, starting VCI = 32

   — Channels 2 and 3 are not used unless valid VPI/VCIs are specified for them

   If you are configuring two different channels on the same VPI, the recommended starting number for the second channel must be at least 432 (24 ports X 18 slots) higher than the first channel's starting number.

8. Check that the Max VCI/VPI is at least 431 greater than the starting VCI for automatic cross connections for each VP used for default connections. This is done automatically for Channels 0 and 1. However, you must do this manually for Channels 2 and 3 if you are using these channels for additional default connections. Be sure to set the Max VCI per VPI for the desired uplink VPIs for Channels 2 and 3, then apply the changes before specifying the channel's VPI and starting VCI numbers.

9. Clear cross connections (**A-E-D**) and reboot the SCM card. This clears all existing cross connections and defines a new set of cross connections based on the default channels that you have just configured for the types of port cards expected to be installed in the chassis.

10. Install each port card (one at a time) into the chassis and check the SCM card's Automatic Cross Connects screen (**A-E-B-D**) after each port card has passed its self-test and appears on the MCP card selection screen. The port card will identify itself and specify how many default cross connections that SCM card should activate for it. It also specifies which one of the four default traffic profiles to use for each channel. The SCM activates the specified number and type of default cross connections for each port on the card.

    *Example:* A Model 8335 ATM SDSL (cells) port card installed in Slot 5 will request that two default connections (with traffic profiles voice and packet) be set up by the SCM for 16 ports on the SCM's ATM bus to Slot 5.

11. If the system default VCs are sufficient and no custom VCs are needed, no more configuration of the ATM section of the SCM card is required. If custom VCs must be configured, see *Setting Up Custom Cross Connections* on page 3-4.

## Setting Up Custom Cross Connections

In addition to up to four sets of default cross connections, there is a group of 250 cross connections allocated to each port card that can be assigned to any port on the card. There are two types of custom cross connections, depending on port card type:

- For packet port cards, custom cross connections are used to bridge multiple ports on the same port card to a given VID (formerly called Bridged connections).
- For cell port cards, custom connections can be used to expand the number of VCs connected to the card. Each of the 250 VCs can be cross-connected from any VC on the uplink to any port on the port card. This is a 1:1 connection (no bridging).

Auto cross connections are created for you. However, if one or more of the following conditions exist, you must create custom cross connections:

- If you want more than two connections per port, you must manually create the extra cross connections.
- If you are upgrading from SCM version 1.0 to version 1.1 or greater and you want to keep the existing cross connections, then you must manually build additional cross connections for voice applications.
- For Models 8314, 8304, 8344, and 8374 ATM DSL cell port cards, you must build custom cross connections to add more VIDs for Bridged connections.

### ▶ Procedure

To set up the SCM card with custom connections:

1. Before configuring custom cross connections, you must specify the Maximum VCI Number for the VPI to be used by these cross connections. Use the Configuration Max VCI per VPI screen (**A-E-B-A**). Apply the changes.
2. Specify custom cross connections on either the Cross Connect Sorted By Slot screen (**A-E-B-A**) or the Cross Connect Sorted By VPI screen (**A-E-B-B**).

# Setting Up Traffic Profiles

Traffic Profiles are required for all connections to allow the SCM to perform its traffic management functions such as Connection Admission Control (CAC). You can define up to 250 traffic profiles for the SCM card using the ATM Traffic Profiles screen (**A-E-C**). Traffic profiles specify the traffic class of the connection and the expected sustained and peak cell rates (SCR and PCR), as well as the Maximum Burst Size (MBS).

It is recommended for ease of administration that the same traffic profile be used on both the SCM card and the ATM SDSL port cards. The same set of traffic profiles should be shared among all ATM SDSL cards in the chassis, and the whole DSL network, if possible.

Traffic profiles that are being used by connections cannot be edited. However, Traffic profiles not in use can be edited. This implies the following:

- To edit a traffic profile that several custom cross connections are using, create a new profile with the desired parameters, then swap the traffic profile names for each affected cross connection. Finally, delete the obsolete traffic profile.
- You can edit default traffic profiles, but only before any port cards have been installed in the chassis and the automatic provisioning of the default connections has begun. To edit default profiles for an operating Hotwire GranDSLAM, you must:
    - Unplug all port cards and reset the SCM card. Or, clear all existing cross connections (a disruptive process).
    - Edit the default traffic profiles.
    - Restart the SCM card.
    - Restart each port card to begin the automatic assignment process for each card.

## Traffic Congestion Management

The SCM card must regulate the traffic placed on its uplink to provide guaranteed or fair access to the uplink bandwidth for a variety of services (data, voice, etc.). The current SCM architecture does not support per-VC buffering/queuing. Instead, it relies on memory shared among all the slots in the Hotwire GranDSLAM and the uplink to support traffic management and Class of Service (CoS) prioritization during periods of congestion. For example, a full Hotwire GranDSLAM with 17 ATM SDSL port cards could theoretically forward 500 Mbps (17 slots X 16 ports per slot X 2 Mbps) of traffic to the SCM card. However, current uplink speeds are 34 Mbps (for an E3 interface), 45 Mbps (for a DS3 interface) or 155 Mbps (for an OC3 interface), with actual payload capacities being slightly less. To manage traffic, the SCM card uses traffic class priorities and traffic class policies.

Traffic class priorities define the order in which cells are switched through the SCM's ATM switching fabric. See *Creating ATM Traffic Profiles* in Chapter 4, *Configuration Menu Options*, for more information on traffic classes and their priorities.

Policies allow a service provider using the Hotwire GranDSLAM to provide service level agreements using lower priority traffic classes. For example, for Frame Relay over DSL service level agreements to be met, the service provider must ensure that this data has guaranteed access to a portion of the uplink bandwidth and it will not be shut out by higher priority services such as Voice over DSL. For this and similar services, the service provider can specify the policies on a fraction of the uplink bandwidth to reserve for three of the four traffic classes: Constant Bit Rate (CBR), Real Time Variable Bit Rate (rt-VBR), and Nonreal Time Variable Bit Rate (nrt-VBR). (Unspecified Bit Rate or UBR has a fixed allocation of 6% so that it is never completely shut out by the higher priority classes.) This partitioning guarantees that at least this set proportion of traffic of a given class will reach the uplink in periods of congestion. These same numbers are used by the CAC function to prevent the SCM from accepting too many connections of a certain type should accepting the connections cause the allocated bandwidth to exceed the reserved bandwidth. By using the ATM Bandwidth Management screen, you can specify the fraction of the uplink bandwidth reserved for three of the four traffic classes. See *Managing Bandwidth* in Chapter 4, *Configuration Menu Options*, for more information.

Bandwidth utilization allows a percentage of excess usage (oversubscription) to be used by the CAC function when admitting new connections. See *Managing Bandwidth* in Chapter 4, *Configuration Menu Options*, for more information.

Policing and traffic shaping can be performed on ATM SDSL port cards (e.g., 8335, 8365) if so configured via the traffic profile associated with the VC. Policing cannot be done on the SCM card. It assumes that traffic has been policed elsewhere in the network. Policing should be done by both the port card, as well as on the far end of the network.

Policing at the port card level (either tagging excess cells which can later be dropped by the SCM card or another ATM network node, or by dropping them immediately at the port card) better regulates the flow of traffic on the SCM card and helps to prevent congestion. However, you must know the various policing parameters (SCR, PCR and MBS) before the service is in use. The policing parameters and the attributes associated with it (PCR, SCR, MBS, CDVT) are used by CAC to determine whether or not to admit a connection.

Default configurations of the Hotwire GranDSLAM are for strict priority handling of traffic assuming voice service (using the rt-VBR traffic class) and best-effort data service (using UBR traffic class). It also assumes that there is no CBR traffic. Traffic profiles must be modified for CBR traffic and lower-priority class services requiring guarantees. Use the ATM Traffic Profiles screen (**A-E-C**) to specify traffic contract parameters for a specified traffic class.

The default applications for the SCM card and the ATM SDSL port card are configured to support a combination of UBR data (usually IP Internet traffic) and rt-VBR data for voice over DSL. The default traffic profiles on the ATM SDSL card(s) have an unspecified value for PCR/SCR in the VOICE-x traffic profile. This allows the access provider to connect from one to as many telephones as either the IAD (Intelligent Access Device) or DSL line speed will support without having to configure the VC through the Hotwire GranDSLAM. However, the default VOICE traffic profile on the SCM card specifies the SCR as 188 cells per second for uncompressed voice and signaling. This allows the SCM card to perform its CAC calculations on the default connections for rt-VBR as each ATM SDSL port card is installed (assuming an average of 4 calls per line X 16 lines). Depending on how you configure the rt-VBR reserved bandwidth percentage (ATM Bandwidth Management screen, **A-E-A-B**), the allocated bandwidth will reach maximum, and a warning will be issued that default connections cannot be completed for this card. At this time, the SCM card sends a warning that the theoretical limit has been reached and additional cross connections added to the SCM card will cause switch congestion. However, the SCM card does not know the real traffic offered by all the Voice over DSL calls on all the port cards in the Hotwire GranDSLAM. Instead, this is an early warning for you to check the SCM card performance using the Buffer Stats screen (**B-E-D-E**).

By viewing the **`Total CLP0+1 Cells Thresholded Egress`** count field on the Buffer Stats screen over a 24-hour period during a normal weekday you can determine if the count has changed.

- If the Egress count has not changed, then the SCM is not overloaded. Then, you can increase the bandwidth utilization factor on the ATM Bandwidth Management screen (**A-E-A-B**) for the rt-VBR class by about 25%. This will allow the new default connections on the last ATM SDSL port card to be established.
- If there has been considerable congestion on the SCM card and the Buffer Stats screen indicates that cells have been discarded, you may need to rethink the traffic reservation percentages for each traffic class. For example, another class may not be using its reserved bandwidth so that you can allocate more to the rt-VBR voice class. If this is not possible, or if the rt-VBR class already has 100% of the bandwidth, then contact your sales representative who can help analyze the SCM card's performance and guide your decisions. You may be able to do one of the following:
  - — If the SCM card has a DS3 or E3 uplink, then replace it by an OC3.
  - — If the SCM card has an IMA uplink, then increase the number of links.
  - — If all uplinks are used, then look at the DS3 uplink.

## ATM Traffic Profiles

Traffic profiles are intended to simplify the configuration process for you. Traffic profiles can also be created with OpenLane™. Refer to OpenLane procedures. There are a limited number of traffic profiles available (250). It is recommended that the same set of profiles be used across the Hotwire GranDSLAM network. There are several default profiles (indicated by being displayed in uppercase) already in the system that you can use:

- **PACKET** – UBR traffic class for TCP/IP-type traffic service using AAL5 that allows data traffic up to the maximum PCR that the data link can handle. There is no policing associated with this connection. All other traffic classes are given priority over UBR. This profile cannot be edited.
- **VOICE** – rt-VBR traffic class for compressed or uncompressed voice service using AAL2 that specifies 80 kbps for voice calls per VC and is used by CAC to limit overload through the SCM by denying requests. The 80 kbps can support one PCM-type voice call and two simultaneous ADPCM-type voice calls. The DSL system will allow as many voice calls from each endpoint as the DSL rate can handle. DSL will allow as many of these voice calls through the SCM card's uplink as is defined by the speed of the uplink and the amount of bandwidth reserved for the rt-VBR service class (ATM Bandwidth Management screen, **A-E-A-B**).

| Name | Class | PD | POL | PCR | CDVT | SCR | MBS |
|---|---|---|---|---|---|---|---|
| PACKET | UBR | Y | N | – | – | – | – |
| VOICE | rt-VBR | N | N | 5424 | – | 188 | – |
| RESERVED1 | UBR | N | N | – | – | – | – |
| RESERVED2 | UBR | Y | N | – | – | – | – |

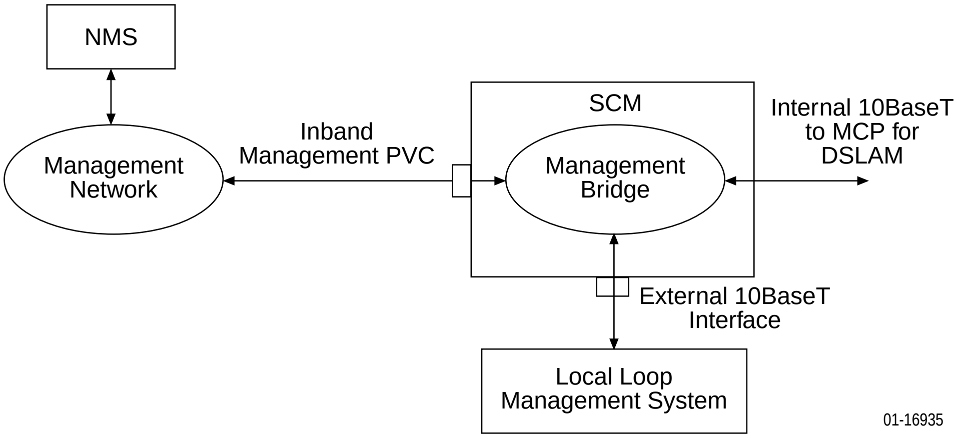
PD = Packet Discard, POL = Policing, PCR = Peak Cell Rate,
CDVT = Cell Delay Variation Tolerance, SCR = Sustained Cell Rate,
MBS = Maximum Burst Size

Traffic Service Class priorities define the priority with which the cells are switched through the SCM card's ATM switching fabric. If a traffic service class is not using the full amount of its reserved bandwidth, that unused portion is offered to the highest priority class. If that class can't use it, the extra bandwidth is offered to the next highest class, and so on down to the lowest class. Service Classes are listed below in priority order (highest to lowest):

- CBR = Constant Bit Rate
- rt-VBR = Real Time Variable Bit Rate. (i.e., voice traffic)
- nrt-VBR = Nonreal Time Variable Bit Rate. (i.e., Frame Relay traffic)
- UBR = Unspecified Bit Rate for packet data

# SCM Bridge Extension

The SCM Management Bridge and the external 10BaseT interface on the SCM card provide management connectivity to the external Turnstone Local Loop Management System. The Turnstone system is colocated with the GranDSLAM in the CO. In the figure below, the inband management PVC on the SCM is carrying the management traffic for both the GranDSLAM and for the Turnstone system. This scheme eliminates the need for an external device in the CO (such as an IPC) required for the aggregation of management traffic. The SCM Bridge is a learning bridge in that it learns the source MAC address of every incoming frame and forwards the frame based on the destination MAC address.


NMS
Management Network
Inband Management PVC
SCM
Management Bridge
Internal 10BaseT to MCP for DSLAM
External 10BaseT Interface
Local Loop Management System
01-16935

# Configuration Menu Options

# 4

## Overview

This chapter describes the options on the Configuration Menu of the SCM card. Use these options to configure your SCM card and customize DSL system applications.

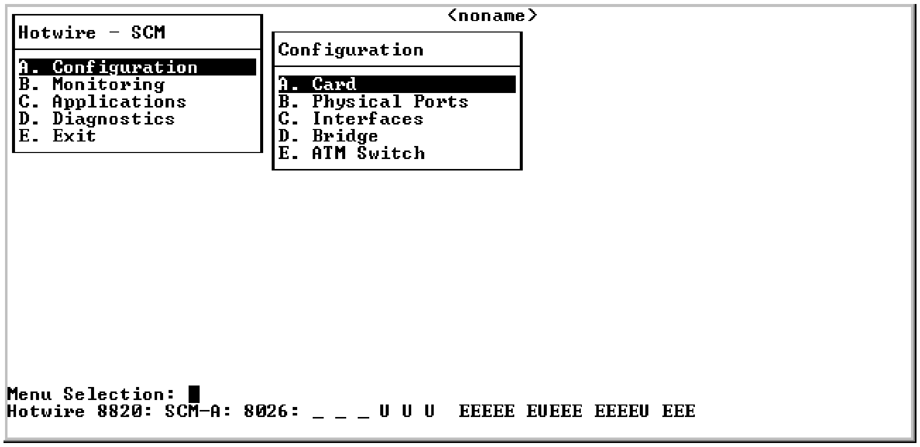
**NOTE:**

You must have Administrator permission to configure the SCM card.

To access the Configuration menu, follow this menu selection sequence:

*SCM Menu* → *Configuration* (**A**)

The Configuration menu appears.



```
                                           <noname>
Hotwire - SCM
                       Configuration
A. Configuration
B. Monitoring          A. Card
C. Applications        B. Physical Ports
D. Diagnostics         C. Interfaces
E. Exit                D. Bridge
                       E. ATM Switch

Menu Selection: █
Hotwire 8820: SCM-A: 8026: _ _ _ U U U  EEEEE EUEEE EEEEU EEE
```

# Configuration Menu Overview

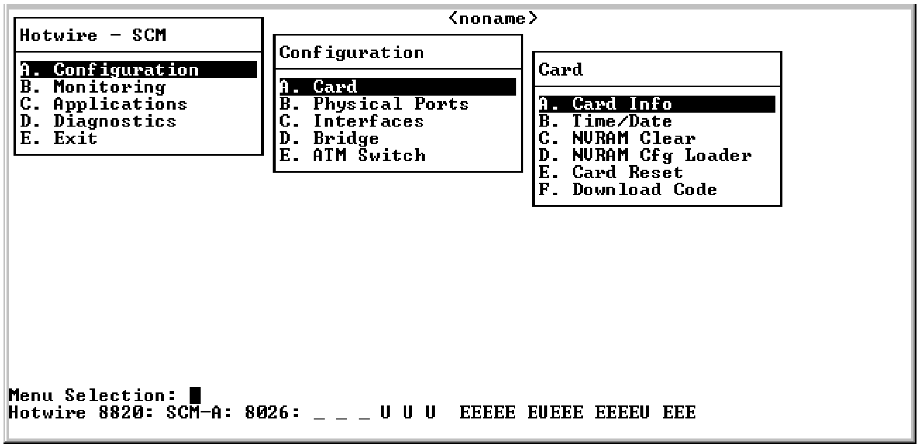
The table below summarizes the options available when you select Configuration on the Hotwire SCM – Main Menu. The Configuration options are arranged into functional groups.

| Select . . . | To Access the . . . | To . . . |
|---|---|---|
| **A. Card** | Card Menu Options (Table 4-1) | ■ Configure SCM card status information<br>■ Display current time and date<br>■ Clear NVRAM<br>■ Upload and download configurations (NVRAM Cfg Loader)<br>■ Reset the SCM card<br>■ Download new firmware |
| **B. Physical Ports** | Physical Ports Menu Option (Table 4-2) for DS3, OC3 or E3 uplinks, and Cfg IMA Parameters Menu Options (Table 4-3) for IMA uplinks | ■ Configure uplink parameter options |
| **C. Interfaces** | Interfaces Menu Options (Table 4-4) | ■ Configure inband management options<br>■ Configure external Ethernet parameters<br>■ Disable or restart the external Ethernet |
| **D. Bridge** | Bridge Menu Option (Table 4-5) | ■ Configure bridge parameters |
| **E. ATM Switch** | ATM Switch Menu Options (Table 4-6) | ■ Configure ATM cross connect parameters<br>■ Define maximum acceptable value in cross connect table for Virtual Channel Identifier (VCI)<br>■ Perform auto cross connects<br>■ Clear all cross connects<br>■ Bind predefined traffic profiles to cross connections<br>■ Specify all traffic contract parameters for a specific type of connection |

# Card Menu

To access the Card menu, follow this menu selection sequence:

*Configuration→Card* (**A-A**)



```
                                        <noname>
 Hotwire - SCM
                        Configuration
 A. Configuration                               Card
 B. Monitoring          A. Card
 C. Applications        B. Physical Ports       A. Card Info
 D. Diagnostics         C. Interfaces           B. Time/Date
 E. Exit                D. Bridge               C. NVRAM Clear
                        E. ATM Switch           D. NVRAM Cfg Loader
                                                E. Card Reset
                                                F. Download Code




Menu Selection:
Hotwire 8820: SCM-A: 8026: _ _ _ U U U  EEEEE EUEEE EEEEU EEE
```

The Card menu provides the following selections:

- **A. Card Info** – Sets up SCM card information.
- **B. Time/Date** – Displays the current time and date as set in the MCP card.
- **C. NVRAM Clear** – Clears non-volatile RAM.
- **D. NVRAM Cfg Loader** – Uploads and downloads configurations.
- **E. Card Reset** – Resets SCM card in the chassis.
- **F. Download Code** – Downloads or applies new firmware to the SCM.

See Table 4-1, Card Menu Options, for information about the options available from the Card menu.

## Entering Card Information

Use the Card Information screen to configure basic card-level information. Fields on this screen are null until you enter values. Allowable values are:

- Numeric characters (0–9)
- Upper- or lowercase alphabetic characters (A–Z)
- Space
- Special characters available on standard keyboards (!, @, #, $, etc.)

### ▶ Procedure

To enter card-level information:

1. Follow this menu selection sequence:

   *Configuration*→*Card*→*Card Info* (**A-A-A**)

   The Card Information screen appears.

2. Type the desired value in each field and press Enter. See Table 4-1, Card Menu Options.

   **NOTE:**

   Use the left and right arrow keys to scroll through the fields.

3. Press Ctrl-z to save the changes and return to the Card menu.

## Clearing NVRAM

The NVRAM Clear screen clears Non-Volatile RAM (NVRAM). You may want to clear the NVRAM to reuse the SCM card or to reconfigure the current card.

Save your configuration using the NVRAM Cfg Loader (**A-A-D**) screen before clearing NVRAM.

**CAUTION:**

**If you select yes on the NVRAM Clear Warning screen, you permanently remove most of the configuration information stored on the card. All uplink parameters and ATM cross connections will need to be reentered. The system performs a reset and returns to the factory default configuration.**

### ▶ Procedure

To clear NVRAM:

1. Follow this menu selection sequence:

   *Configuration→Card→NVRAM Clear* (**A-A-C**)

   The NVRAM Clear screen appears. See Table 4-1, Card Menu Options.

2. At the **`Initialize NVRAM:`** prompt, do one of the following:

   — Type **yes** to clear the NVRAM and return to default values.

   — Type **no** to perform no action.

   The system beeps and no action is taken.

3. Press Ctrl-z to return to the Card menu.

## Uploading/Downloading Configuration Data from a TFTP Server (NVRAM Config Loader)

Use the NVRAM Config Loader screen to upload configurations to and download the SCM's configuration from a Trivial File Transfer Protocol (TFTP) server.

### ▶ Procedure

To upload or download NVRAM configuration data:

1. Follow this menu selection sequence:

   *Configuration→Card→NVRAM Cfg Loader* (**A-A-D**)

   The NVRAM Cfg Loader screen appears.

2. Type the desired value in each field and press Enter. See Table 4-1, Card Menu Options.

   When the transfer completes, the Transfer Status field changes to **`Completed successfully`** and the screen displays the following information:

   **`Packets Sent`** – Number of packets sent in download.

   **`Packets Received`** – Number of packets received in download.

   **`Bytes Sent`** – Number of bytes sent in download.

   **`Bytes Received`** – Number of bytes received in download.

   **`Transfer Status`** – Status of the upload or download.

3. Press Ctrl-z to return to the Card menu.

   **NOTE:**

   The SCM card auto resets after downloading a config file and returns to the Quick Card Select screen.

## Resetting the SCM Card

Use the Card Reset screen to reset the SCM card. This command resets all counters to zero. If a new configuration or software version has been downloaded, a card reset allows the new code to become active.

**NOTE:**

An SCM card reset interrupts all user data traffic aggregated through the SCM. It does not interrupt user data traffic on port cards with an Ethernet uplink in the chassis.

### ▶ Procedure

To reset the SCM card:

1. Follow this menu selection sequence:

   *Configuration*→*Card*→*Card Reset* (**A-A-E**)

   The Card Reset screen appears.

2. At the **`Reset Card:`** prompt, do one of the following:

   — Type **yes** to reset the card.

   This action disrupts operation of the SCM card for at least 30 seconds and returns to the Quick Card Select screen.

   — Type **no** to perform no action.

   The system beeps and no action is taken.

   — Press Ctrl-z to return to the Card menu without resetting the card.

## Downloading Code

The Download Code menu option gives you the ability to upgrade your software with a new version of code and then apply this code to your system.

New firmware releases are typically applied to the SCM, MCP or DSL cards, or to the Service Node in your system.

When you are downloading code to an endpoint, verify that your TFTP server has the following timeout values, or your download may fail:

- **Retransmission timeout** – Value not less than 10 seconds.
- **Total transmission** – Value not less than three times the retransmission timeout.

## Upgrading

When upgrading from firmware versions higher than 1.0, your standard cross connections and configuration settings will be preserved across the upgrade. You can manually enter standard cross connections on VID/Channel1 for VOICE.

Alternatively, if you choose to add auto cross connects for VOICE (Channel 1), you must delete current cross connects. The following procedure is recommended:

### ▶ Procedure

1. Capture your current cross connection configuration settings by printing your current settings via screen capture.
2. Configure the uplink starting VCI/VPI for auto cross connects for Channel 0 (PACKET) and Channel 1 (VOICE) (see Table 4-6, ATM Switch Menu Options). Cross connects are automatically built based on this configuration.
3. Clear all cross connections and perform a reset. All manually entered cross connections have now been lost.
4. Using your printout of configuration settings, reenter the manually set cross connections.

## Card Menu Options

For Card menu options, refer to Table 4-1, Card Menu Options. To access the Card menu, follow this menu selection sequence:

*SCM Main Menu→Configuration→Card* (**A-A**)

**Table 4-1. Card Menu Options (1 of 3)**

| **Card Info** | **A-A-A** |
|---|---|
| Gives you the ability to configure basic card-level information.<br>NOTE: Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.<br>**Card Name** – Up to 16 alphanumeric characters (Default = <noname>). Name assigned to the card.<br>**Card Contact** – Up to 32 alphanumeric characters (Default = <nobody>). Name or number of party responsible for card.<br>**Card Location** – Up to 16 alphanumeric characters (Default = <nowhere>). Location assigned to the system.<br>**Local Control Terminal Port Mode** – The terminal port mode for the local or console session: Standard or Extended (Default = Standard). Standard is for USA keyboards; Extended is for European keyboards.<br>**Remote Control Terminal Port Mode** – The terminal port mode for the Telnet session: Standard or Extended (Default = Standard). Standard is for USA keyboards; Extended is for European keyboards. | |
| **Time/Date** | **A-A-B** |
| **Timezone** – Displays system's time zone as set on the MCP card.<br>**Time/Date** – Displays current time and date as set on the MCP card. | |
| **NVRAM Clear** | **A-A-C** |
| Gives you the ability to clear out the Non-Volatile RAM (NVRAM) in order to reuse the card or to reconfigure the current card.<br>CAUTION: If you select yes on this screen, you permanently remove most of the configuration information and all uplink parameters and ATM cross connections will have to be reentered. The system performs a reset and returns to the factory configuration. | |

**Table 4-1. Card Menu Options (2 of 3)**

| **NVRAM Config Loader** | **A-A-D** |
|---|---|
| Gives you the ability to upload or download a copy of the card's binary configuration data to or from a Trivial File Transfer Protocol (TFTP) server.<br>**Configuration File Name** – The file name may be a path name of directories separated by a forward slash (/) ending with the file name. The total path name length must be less than 40 characters. If the TFTP server is hosted by a DOS machine running other than Windows 2000 or Windows NT, then directory and file names must follow the 8.3 DOS naming convention.<br>**DOS Machine** (for upload only)<br>If your server is hosted by a DOS machine, you must name the file to be uploaded using the DOS convention 8-character length. The system automatically uploads the configuration file and creates directories and files as needed.<br>**UNIX Machine** (for upload only)<br>If your server is hosted by a UNIX machine, the configuration file you name **is not** created on the UNIX system by the TFTP server. It is **critical** that you work with your system administrator to plan naming conventions for directories, file names, and permissions so that anyone using the system has read and write permissions. (This is a UNIX system security feature.)<br>NOTE: This must be done before you can upload files to a UNIX server.<br>**TFTP Server IP Address** – *Host name* (with DNS entry) or IP address *(nnn.nnn.nnn.nnn)* format.<br>**TFTP Transfer Direction** – Upload/Download (Default = Upload). Select Upload to store a copy of the card's configuration on the server. Select Download to have the file server send a copy of the stored configuration file to the card.<br>**Start Transfer** – Yes/No (Default = No).<br>Displays after transfer:<br>**Packets Sent** – Number of packets sent in download.<br>**Packets Received** – Number of packets received in download.<br>**Bytes Sent** – Number of bytes sent in download.<br>**Bytes Received** – Number of bytes received in download.<br>**Transfer Status** – Status of the upload or download transfer.<br>NOTE: After a download, the SCM card will auto reset for the new configuration to take effect. | |
| **Card Reset (Reset System)** | **A-A-E** |
| Gives you the ability to reset the cards. This resets all counters to zero. If a new configuration or software version has been downloaded, the new code becomes active.<br>**Reset Card** – Enter Yes to reset card.<br>NOTE: This action disrupts the data flow for at least 3 minutes. | |
| **Download Code (Download Code and Apply Download)** | **A-A-F** |
| Gives you the ability to download a new version of code and apply the downloaded code. | |

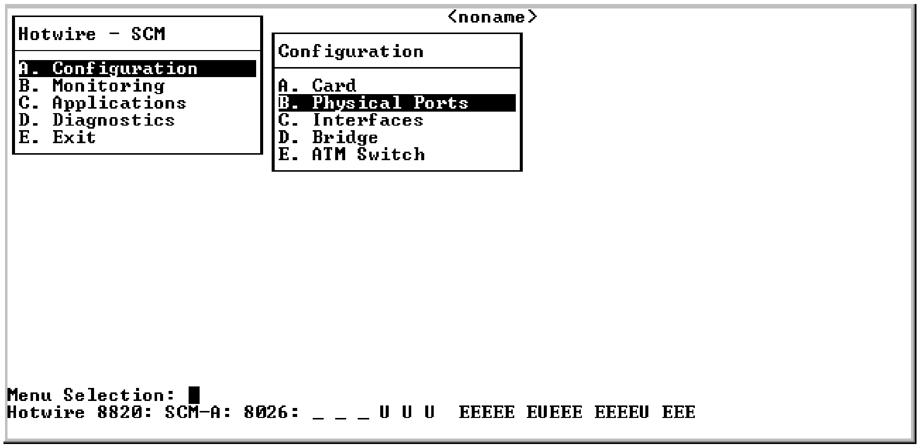
**Table 4-1. Card Menu Options (3 of 3)**

| **Download Code** | **A-A-F-A** |
|---|---|
| This screen is similar to the NVRAM Config Loader screen.<br>**Image File Name** – The file name may be a regular path name separated by a forward slash (/) ending with the file name. The total path name length must be less than 40 characters. If the TFTP server is hosted by a DOS machine, then directory and file names must follow the 8.3 naming convention imposed by DOS.<br>**TFTP Server IP Address** – *nnn.nnn.nnn.nnn* format.<br>**Start Transfer** – Yes/No (Default = No).<br>Displays after transfer:<br>**Packets Sent** – Number of packets sent in download.<br>**Packets Received** – Number of packets received in download.<br>**Bytes Sent** – Number of bytes sent in download.<br>**Bytes Received** – Number of bytes received in download.<br>**Transfer Status** – Status of the download transfer.<br>Once the download is complete, press Ctrl-z to exit back to the Download Code submenu and select Apply Download. | |
| **Apply Download (Reset System)** | **A-A-F-B** |
| This selection applies the downloaded code and drops all connections by performing a device reset to the SCM card. This screen is used to overlay the previously downloaded image for the card. If you select yes at the `Reset System` prompt, the system goes through a system restart and interrupts service on the card. | |

# Physical Ports Menu

To access the Physical Ports menu, follow this menu selection sequence:

*Configuration→Physical Ports* (**A-B**)



```
                                        <noname>
Hotwire - SCM
                      Configuration
A. Configuration
B. Monitoring         A. Card
C. Applications       B. Physical Ports
D. Diagnostics        C. Interfaces
E. Exit               D. Bridge
                      E. ATM Switch

Menu Selection: █
Hotwire 8820: SCM-A: 8026: _ _ _ U U U  EEEEE EUEEE EEEEU EEE
```

The Physical Ports menu provides the following selection:

- **A. Uplink Parameters** – Allows you to configure parameters for one of the following types of uplinks:
  - — DS3
  - — OC3
  - — E3
  - — IMA

  The Uplink Parameters screen differs depending on the type of uplink you have.

## Physical Ports Menu Option

For the Physical Ports menu option, refer to Table 4-2, Physical Ports Menu Option. To reach the Physical Ports menu, follow this menu selection sequence:

*SCM Main Menu→Configuration→Physical Ports* (**A-B**)

**Table 4-2. Physical Ports Menu Option (1 of 2)**

**Configuration DS3 Uplink Parameters** **A-B-A**

Allows you to define the operation of a DS3 link.

NOTE: Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.

**Uplink #** – Displays 1. (This field is read-only.)

**Line Width** – Displays DS3 45 Mbps. (This field is read-only.)

**Circuit ID** – Enter up to 256 characters to identify the circuit/link/line.

**Transmit Clock** – Select one of the following for the DS3 link's transmit side clocking (Default = Loop):

- Loop = Use the clock derived from the DS3 link’s receive side to drive the link’s transmit side.
- Local = Use the SCM card’s internal oscillator to drive the DS3 link’s transmit side.

**Line Length** – Enter a number between 0 and 900 for length in feet (Default = 95). When saved, this value converts to meters, so the display can vary by +/- 3 feet when you reenter the screen.

NOTE: Transmission errors can result from setting this field inaccurately.

**Line Status Change Trap Enable** – Yes/No (Default = yes). Enter yes to send change-of-state SNMP traps to the NMS.

**Frame Type** – Direct/PLCP (Default = Direct). Select the type of cell mapping that will be used to map ATM cells into the DS3 C-Bit Parity format.

**C-Bit Parity Ignore** – Yes/No (Default = no). If you enter yes, C-bit parity errors will not be registered.

**Cell Scrambling** – Yes/No (Default = yes). Enter yes to scramble payload cell data.

**Far End Loopback Timer** – 0, 2, 15, 30 or 60 minutes (Default = 0). This timer is used to limit the duration of any line loopback initiated from a DS3 command received from the far end. If you enter 0, then far-end commands will not be supported.

**Table 4-2. Physical Ports Menu Option (2 of 2)**

| Configuration OC3 Uplink Parameters | A-B-A |
|---|---|

Allows you to define the operation of an OC3 link.

> NOTE: Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.

**Uplink #** – Displays 1. (This field is read-only.)

**Line Width** – Displays OC3 155 Mbps. (This field is read-only.)

**Line Type** – MMF (2 Km)/SMF (15 Km)/SMF (40 Km). Displays the type of interface supported by the link. (This field is read-only.)

- MMF (2 Km) = Multi Mode Fiber with a nominal range of 2 Km
- SMF (15 Km) = Single Mode Fiber with a nominal range of 15 Km
- SMF (40 Km) = Single Mode Fiber with a nominal range of 40 Km

**Mode of Operation** – SONET STS-3c/SDH STM-1 (Default = SONET STS-3c).

**Circuit ID** – Enter up to 256 characters to identify the circuit/link/line.

**Transmit Clock** – Select one of the following for the OC3 link's transmit side clocking (Default = Loop):

- Loop = Use the clock derived from the OC3 link's receive side to drive the link's transmit side.
- Local = Use the SCM card's internal oscillator to drive the OC3 link's transmit side.

**Line Status Change Trap Enable** – Yes/No (Default = yes). Enter yes to send change-of-state SNMP traps to the NMS.

**Cell Scrambling** – Yes/No (Default = yes). Enter yes to scramble payload cell data. If using an IPC, this field must be set to yes.

| Configuration E3 Uplink Parameters | A-B-A |
|---|---|

Allows you to define the operation of an E3 link.

> NOTE: Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.

**Uplink #** – Displays 1. (This field is read-only.)

**Line Width** – Displays E3 34 Mbps. (This field is read-only.)

**Circuit ID** – Enter up to 255 characters to identify the circuit/link/line.

**Transmit Clock** – Select one of the following for the E3 link's transmit side clocking (Default = Loop):

- Loop = Use the clock derived from the E3 link's receive side to drive the link's transmit side.
- Local = Use the SCM card's internal oscillator to drive the E3 link's transmit side.

**Line Length** – Enter a number between 0 and 300 for length in meters (Default = 67).

> NOTE: Transmission errors can result from setting this field inaccurately.

**Line Status Change Trap Enable** – Yes/No (Default = yes). Enter yes to send change-of-state SNMP traps to the NMS.

**Frame Type** – Direct/PLCP (Default = Direct). Enter the type of mapping used to map ATM cells into the E3 format.

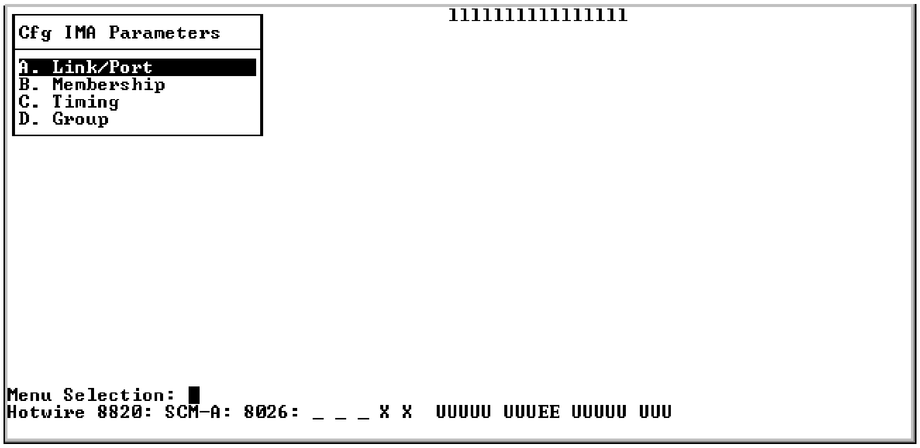
**Cell Scrambling** – Yes/No (Default = yes). Enter yes to scramble payload cell data.

**Timing Marker Code To Send** – Traceable/Not Traceable (Default = Not Traceable). Determines whether a timing source is traceable to a primary reference source. This field is not supported when Frame Type is set to PLCP.

## Uplink Parameters Menu (for IMA Uplink)

To access the Uplink Parameters menu for the IMA uplink, follow this menu selection sequence:

*Configuration→Physical Ports→Uplink Parameters* (**A-B-A**)



```
Cfg IMA Parameters                            1111111111111111

A. Link/Port
B. Membership
C. Timing
D. Group

Menu Selection: █
Hotwire 8820: SCM-A: 8026: _ _ _ X X  UUUUU UUUEE UUUUU UUU
```

The Cfg IMA Parameters menu provides the following selections:

- **A. Link/Port** – Defines the IMA link/port parameters.
- **B. Membership** – Assigns and unassigns links to IMA groups.
- **C. Timing** – Defines IMA group timing.
- **D. Group** – Defines IMA group parameters.

See Table 4-3, Cfg IMA Parameters Menu Options, for information about parameters available from the Cfg IMA Parameters menu.

### Table 4-3. Cfg IMA Parameters Menu Options (1 of 4)

**Cfg IMA Parameters**
**Link/Port (Configuration IMA Link Parameters)** **A-B-A-A**

Allows you to define the IMA Link/port parameters.

> NOTE: Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.

**Link/Port** – wan1– wan8 (Default = wan1). Enter the physical link/port to configure.

**Member of Group** – Displays the Group Membership setting (none or ima1) configured on the IMA Group Membership Configuration screen (**A-B-A-B**). (This field is read-only.)

**Administrative Status** – Enable/Disable (Default = Enable for wan1 and Disable for wan2 – wan8). Enter Enable to enable the physical link. Statistics (**B-B-B-A**) and alarms (**D-B-C**) are only reported on links that have been enabled. To disable a link, you must first remove it from group membership (**A-B-A-B**).

**Line Type** – DS1/E1 75 ohm/E1 120 ohm. Displays the type of IMA uplink, as determined by model number. (This field is read-only.)

- DS1 = Model 8026
- E1 75 ohm = Model 8027
- E1 120 ohm = Model 8028

**Circuit ID** – Enter up to 32 characters to identify the circuit/link/line.

**Frame Format** – Select the frame format for the link, depending on IMA uplink type:

- For DS1 (Model 8026), select ESF or SF (Default = ESF).
- For E1 (Models 8027/8028), select CRC-4 or non-CRC (Default = CRC-4).

**Line Length (feet)/Line Build Out** – Enter the line length or line build out value (depending on IMA uplink and line type) to configure the line interface (Default = 1 m):

- Line Length = For DS1 (Model 8026) short haul and CSU-type connections, and E1 (Models 8027/8028). Enter 1– 2000 meters for line length used.
- Line Build Out = For DS1 (Model 8026) CSU-type connections only, enter LBO0 (0 db), LBO7 (–7 dB), LBO15 (–15 dB0), LBO22 (–22dB), or 1–200 m.

**Line Status Change Trap Enable** – Yes/No (Default = No). Enter Yes to send change-of-state SNMP traps to the NMS.

**Far End Loopback Timer** – 0, 2, 15, 30, or 60 minutes (Default = 0). This timer is used to limit the duration of any line loopback initiated from the far end. If you enter 0, then far-end commands will not be supported.

**Cell Scrambling** – Yes/No (Default = No for DS1 Model 8026 and Yes for E1 Models 8027 and 8028). Enter whether cell scrambling is to be in effect.

**Tx Clock Timing Source** – Displays the Link Tx Clock Timing setting configured on the IMA Group Timing Configuration screen (**A-B-A-C**). (This field is read-only.)

**Link Providing Clock for Group** – Displays the Link Providing Clock setting configured on the IMA Group Timing Configuration screen (**A-B-A-C**). (This field is read-only.)

**Save changes?** – Type yes or no. If yes, you can configure another link immediately without exiting this screen. Or, press Ctrl-z to save the changes and exit the screen.

### Table 4-3. Cfg IMA Parameters Menu Options (2 of 4)

**Cfg IMA Parameters**
**Configuration IMA Group Membership** **A-B-A-B**

Allows you to assign and unassign links to IMA groups.

NOTES:

– Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.

– If an IMA pattern test or an IMA Link/Port diagnostic test is in progress, IMA Group information cannot be changed. You must first remove a link from a group before using the Link/Port Parameter Configuration screen (**A-B-A-A**) to disable it. You must first enable a link using the Link/Port Parameter configuration screen (**A-B-A-A**) before attempting to add it to the group.

– If a link is providing clock for a group, it cannot be removed from that group.

– A link cannot be removed from an IMA group if there is not sufficient bandwidth in the remaining links to support cross connects that have already been accepted.

**Group** – Displays ima1. (This field is read-only.)

**Change Group Membership** – Use the Index and Link fields to change IMA group membership:

**Index** – Enter the index number of the item you wish to modify, or enter **0** to add a wan link to the ima1 group. The only type of modification allowed on index 1–8 is deleting an entry.

**Link** – Enter the link to be added (wan1–wan8), or enter “-” to delete an entry. Ctrl-v displays a list of unassigned wan links.

**Save changes?** – Type yes or no.

**Current Group Membership** – Displays the current members of the group being configured. (This field is read-only.) An asterisk (*) indicates that a wan link is providing clock for the group:

- Index = A static display count for each of the available group membership assignments.
- Link = A static display of the wan links assigned as members to the group being configured. You must first administratively enable a link before adding it to a group.

**Cfg IMA Parameters**
**Configuration IMA Timing Parameters** **A-B-A-C**

Allows you to define the IMA group timing. Clock source configuration selections for the IMA Group and the link facilities determine the Group Mode selection.

NOTES:

– Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.

– If an IMA pattern test or an IMA Link/Port diagnostic test is in progress, you cannot change these options. Also, an IMA Link/Port diagnostic test prevents you from changing the Link Tx Clock Timing state for any IMA links with active Link/Port tests.

**Group** – ima1/none (Default = ima1). Select the IMA group for which timing parameters will be configured. If you select ima1, you can configure all timing parameters for the group and all links in the group. If you select none, only the Link Tx Clock Timing Source fields will display and you can configure timing for all links which are not assigned to a group.

**Table 4-3. Cfg IMA Parameters Menu Options (3 of 4)**

**Cfg IMA Parameters**
**Configuration IMA Timing Parameters *(Continued)*** **A-B-A-C**

**Group Tx Clock Source** – Select one of the following (Default = interface):

- Interface = Clock is derived from a WAN interface, which means that a clock reference is selected from a WAN facility assigned to the IMA Group. You must also select one of the wan links to provide its recovered receive clock to the Tx clock unit as a source. The WAN facility chosen to provide the reference source is presumed to have a stable clock source at the far end. If the configured wan link/port is disabled or unusable, clock source reverts to Internal. If there are no links assigned to this group, you cannot choose the interface selection.
- Internal = Clock is derived from the internal oscillator on the IMA uplink on the SCM card. The clock is stable, but does not conform nor is it traceable to any Network Timing Standard source.

NOTE: The IMA device and additional hardware make the source you select for the IMA Group available as a transmit clock reference for each of the facilities.

**Link Providing Clock** – wan1– wan8 (Default = wan1). This field displays only if you chose the interface selection for Group Tx Clock Source. Enter the wan link to provide timing to the group clock. Only links assigned to the specified group are valid entries.

**Group Tx Clock Mode** – Selects how the IMA Group and all of the member facilities are clocked relative to each other. Group Mode must be the same at both ends. Select one of the following (Default = common):

- Common = Common Transmit Clock (CTC). The IMA Group and all of the member facilities configured use the same clock source.
- Independent = Independent Transmit Clock (ITC). The IMA Group and some of the member links are allowed to choose different clock sources. Any single facility configured for loop timing requires Group Tx Clock Mode to be set to Independent.

**Link Tx Clock Timing Source** – This table consists of the following fields:

- Index = Static display count for each of the entries in the table.
- Link = Static display of wan links assigned as members to the group being configured.
- Timing = Enter the link clock timing. Only displays values for wan links assigned to the group being configured. Select one of the following (Default = Local).:
  - Local = This is the source provided by the IMA Group selection. It may be derived from another WAN (Interface) or generated internally (Internal) as determined by the Group Tx Clock Source selection. In any case, each link facility is configured so that the source is not its own recovered timing, but the one determined by the clock for the IMA Group.
  - Loop = The reference chosen for the facility transmit timing is solely its own recovered clock.

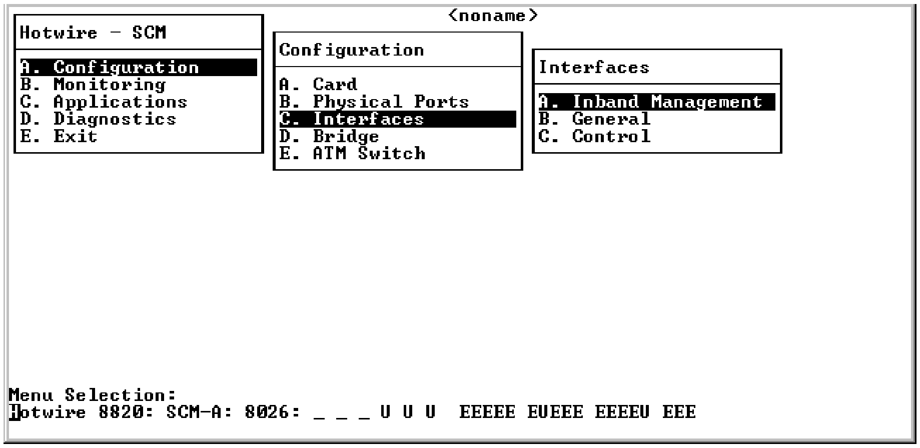
**Table 4-3. Cfg IMA Parameters Menu Options (4 of 4)**

| **Uplink Parameters**<br>**Configuration IMA Group Parameters** **A-B-A-D** |
|---|
| Allows you to define the IMA group parameters.<br>NOTES:<br>– Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.<br>– If an IMA pattern test is in progress, you cannot change these options. An IMA Link/Port diagnostic test will not prevent you from changing the IMA group parameters.<br>**Group** – Displays ima1. (This field is read-only.)<br>**Description** – Up to 32 alphanumeric characters (Default = blank). Enter a descriptive identifier.<br>**Administrative Status** – Enable/Disable (Default = Enable). Allows you to enable or disable the IMA group.<br>**Minimum Number of Links** – 1– 8 (Default = 1). Specify the minimum acceptable number of active links/ports for the IMA group to become operational.<br>**Invalid ICP before HUNT** – 1– 2 (Default = 2). Specify the number of invalid ICP cells allowed before going from the SYNC state to the HUNT state.<br>**Consecutive Errored ICP before HUNT** – 1– 5 (Default = 2). Specify the number of consecutive errored ICP cells allowed before going from the SYNC state to the HUNT state.<br>**Consecutive Valid ICP before SYNC** – 1– 5 (Default = 2). Specify the number of consecutive valid ICP cells required before going from the PRESYNC state to the SYNC state.<br>**IMA Frame Length** – 32/64/128/256 (Default = 128). Enter the frame length used by the near-end IMA group.<br>NOTE: IPC Release 4.1.3GA only supports a frame size of 128.<br>**Group Restart**– Yes/No (Default = No). Enter Yes to cause the IMA Group to be restarted.<br>**Tx Clock Source** – Displays the currently configured Tx Clock Source (**A-B-A-C**).<br>**Link Providing Clock** – This field displays only if you chose the interface selection for Group Tx Clock Source (**A-B-A-C**). Displays the wan link selected to provide timing to the group clock.<br>**Tx Clock Mode** – Displays the currently configured Tx Clock Mode (**A-B-A-C**). |

# Interfaces Menu

To access the Inband Management menu, follow this menu selection sequence:

*Configuration→Interfaces* (**A-C**)



```
Menu Selection:
Hotwire 8820: SCM-A: 8026: _ _ _ U U U  EEEEE EUEEE EEEEU EEE
```

The Interfaces menu provides the following selections:

- **A. Inband Management** – Allows you to define the Inband Management VPI/VCI and the operation of the SCM uplink's inband management channel.
- **B. General** – Defines external Ethernet parameters.
- **C. Control** – Disables or restarts the external Ethernet.

See Table 4-4, Interfaces Menu Options, for information about parameters available from the Interfaces menu.

**NOTE:**

Configure inband management only if the MCP card has also been configured for Inband Channel operation. See the *Hotwire Management Communications Controller (MCC) Card, IP Conservative, User's Guide* for more information. Inband management can only be configured from a directly connected terminal and not through a Telnet session.

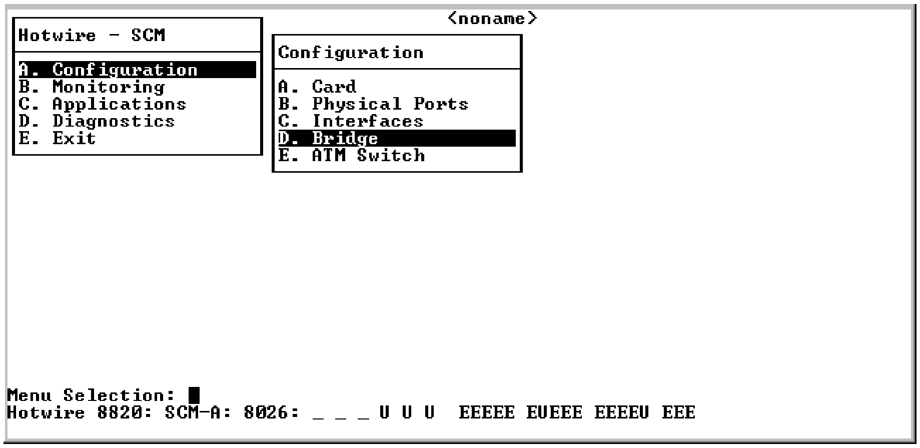
**Table 4-4. Interfaces Menu Options**

| **Inband Management** | **A-C-A** |
|---|---|
| Allows you to define the uplink VPI/VCI and the operation of the SCM uplink's inband management channel.<br>**Inband Management Uplink #** – Displays 1. (This field is read-only.)<br>**Inband Management VPI** – The number of the uplink VPI (0–255) associated with the inband management channel.<br>**Inband Management VCI** – The number of the uplink VCI (1–8191) associated with the inband management channel (0 through 31 are generally reserved).<br>**Bridged Ethernet /802.3 PDU Mode** – FCS/No FCS. Determines whether the inband management Ethernet PDUs contain a LAN FCS. | |
| **General** | **A-C-B** |
| Allows you to display the Maximum Transmission Unit (MTU) for the external Ethernet port (Eth2).<br>**Interface Name** – Displays the name of the external Ethernet interface (Eth2). (This field is read-only.)<br>**Type** – Displays Static for the interface type. (This field is read-only.)<br>**Protocol** – Displays Ethernet for the interface protocol. (This field is read-only.)<br>**Port list** – Displays Eth2 for the port list. (This field is read-only.)<br>**MTU** – Displays 1500. The MTU for the external Ethernet port and the SAR port in bytes. | |
| **Control** | **A-C-C** |
| Allows you to disable or reset the external Ethernet interface. The Eth2 status is dormant (disabled) when the SCM is first powered-on. You must do a reset to enable it. If a 10BaseT cable is attached to Slot A and the correct Ethernet protocol is recognized, the interface Bridging state will change to Up. If the cable is removed or if the device connected to the port fails, the Bridging state changes to Down and a Link Down alarm and trap will be generated.<br>**Interface Name** – Displays the name of the external Ethernet interface (Eth2). (This field is read-only.)<br>**Type** – Displays Static for the interface type. (This field is read-only.)<br>**Link protocol** – Displays Ether for the interface protocol. (This field is read-only.)<br>**Uptime** – Displays the length of time that the interface has been available. If the interface is not disabled, this represents the length of time since the SCM card was last powered-on or reset. (This field is read-only.)<br>**Inactive** – Displays the length of time since data was last transmitted on this interface. (This field is read-only.)<br>**Connect Time** – Displays the length of time since the physical connection was removed. (This field is read-only.)<br>**Reset/Disable** – Enter Reset to enable the external Ethernet interface (brings the interface down, then up which clears statistics, etc.). Or, enter Disable to remove the external Ethernet interface from the bridge. | |

# Bridge Option

To access the Bridge option, follow this menu selection sequence:

*Configuration→Bridge* (**A-D**)



```
Menu Selection:
Hotwire 8820: SCM-A: 8026: _ _ _ U U U  EEEEE EUEEE EEEEU EEE
```

See Table 4-5, Bridge Option, for information about the Bridge option.

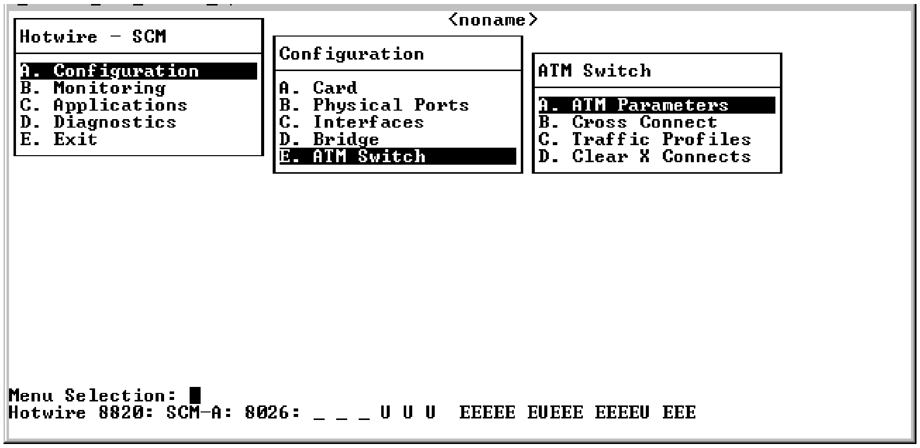
**Table 4-5. Bridge Option**

| **Bridge** | **A-D** |
|---|---|
| Allows you to define the bridge parameters.<br>**Complete MAC Entry Timeout** – 10 – 1,000,000 seconds (Default = 300). Enter the bridge MAC entry aging timout.<br>**Complete MAC Entry Cleanup Interval** – 5 – MAC Entry Timeout in seconds (Default = 150). The cleanup interval is typically set to half of the bridge MAC entry aging timeout. The more frequently a cleanup is set occur (the lower the number selected), the more overhead involved. | |

# ATM Switch Menu

To access the ATM Switch menu, follow this menu selection sequence:

*Configuration→ATM Switch* (**A-E**)



```
                                                <noname>
Hotwire - SCM
                     Configuration
A. Configuration                              ATM Switch
B. Monitoring        A. Card
C. Applications      B. Physical Ports        A. ATM Parameters
D. Diagnostics       C. Interfaces            B. Cross Connect
E. Exit              D. Bridge                C. Traffic Profiles
                     E. ATM Switch            D. Clear X Connects

Menu Selection: █
Hotwire 8820: SCM-A: 8026: _ _ _ U U U  EEEEE EUEEE EEEEU EEE
```

The ATM Switch menu provides the following selections:

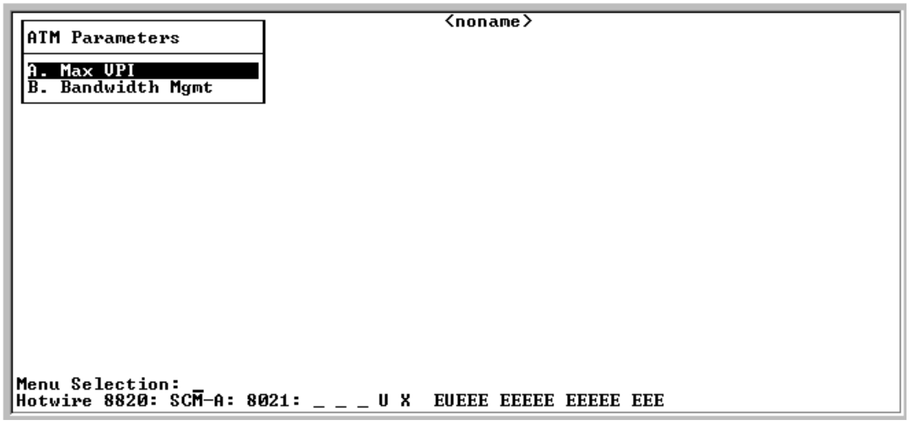
- **A. ATM Parameters** – Configures general ATM parameters.
- **B. ATM Cross Connects** – Defines the ATM cross connections on the SCM card and related parameters.
- **C. ATM Traffic Profiles** – Specifies all traffic contract parameters for a particular type of connection.
- **D. Clear X Connects** – Clears all of the cross connects on the SCM.

See Table 4-6, ATM Switch Menu Options, for information about the options available from the ATM Switch menu.

## ATM Parameters Menu

To access the ATM Parameters menu, follow this menu selection sequence:

*Configuration→ATM Switch →ATM Parameters* (**A-E-A**)



```
                                              <noname>
 ATM Parameters

 A. Max VPI
 B. Bandwidth Mgmt







Menu Selection: _
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The ATM Parameters menu provides the following selections:

- **A. Max VPI** – Defines the maximum Virtual Path Identifier (VPI) supported by the uplink. Currently, this is not configurable and defaults to a value of 255.
- **B. Bandwidth Mgmt** – Defines how new VCs of various classes of traffic are admitted to the SCM and how the traffic classes are serviced during periods of congestion.

See Table 4-6, ATM Switch Menu Options, for information about the options available from the ATM Parameters menu.

## Managing Bandwidth

Use the ATM Bandwidth Management screen (**A-E-A-B**) to set parameters that affect how new VCs of various classes of ATM traffic are admitted to the SCM (CAC involving bandwidth reservation and utilization) and how these traffic classes are serviced when there is congestion present on the switch (bandwidth reservation). These parameters apply regardless of how many VCCs are defined for the port. See *Creating ATM Traffic Profiles* on page 4-33 for more information on service classes.

Connection Admission Control (CAC) is responsible for tracking the resources of the SCM card to determine whether there are enough resources available to support a new PVC request. The sum of the Peak Cell Rate (PCR) for all Constant Bit Rate (CBR) connections cannot exceed the uplink bandwidth (oversubscription).

Bandwidth partitioning guarantees that at least the set proportion of traffic of a given class will reach the uplink in periods of congestion. These same numbers are used by the CAC function to prevent the SCM from accepting too many connections of a certain type if accepting the connection causes the allocated bandwidth to exceed the reserved bandwidth.

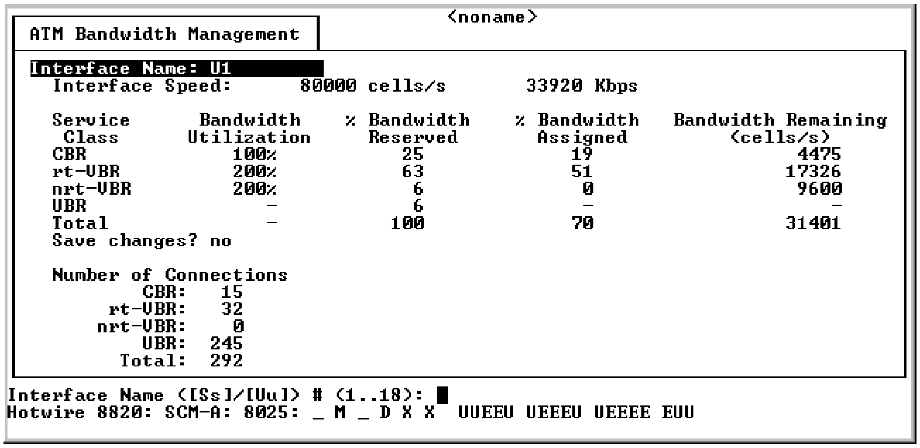
### ▶ Procedure

To manage bandwidth:

1. Follow this menu selection sequence:

   *Configuration→ATM Switch→ATM Parameters → Bandwidth Mgmt* (**A-E-A-B**)

   The ATM Bandwidth Management screen appears. See Table 4-6, ATM Switch Menu Options.



```
                                          <noname>
 ATM Bandwidth Management

 Interface Name: U1
   Interface Speed:      80000 cells/s       33920 Kbps

   Service       Bandwidth    % Bandwidth    % Bandwidth   Bandwidth Remaining
    Class       Utilization    Reserved       Assigned        (cells/s)
   CBR              100%          25             19               4475
   rt-VBR           200%          63             51              17326
   nrt-VBR          200%           6              0               9600
   UBR                -            6              -                  -
   Total              -          100             70              31401
   Save changes? no

   Number of Connections
           CBR:   15
        rt-VBR:   32
       nrt-VBR:    0
           UBR:  245
         Total:  292
Interface Name ([Ss]/[Uu]) # (1..18): █
Hotwire 8820: SCM-A: 8025: _ M _ D X X  VVEEV VEEEV VEEEE EVV
```

2. At the **`Interface Name`** prompt, enter the slot number (1–18), or u1 for Uplink 1 for the interface that the parameters apply to.

3. In the **`Bandwidth Utilization`** field, enter a percentage of excess usage (oversubscription) to be used by the CAC in admitting new connections for each class of service:

   — CBR – Fixed at 100%

   — rt-VBR – Enter 0–9999 (Default = 200%)

   — nrt-VBR – Enter 0–9999 (Default = 200%)

   — UBR – Read-only (this is a best effort service). UBR has a fixed allocation of 6% so that it is never completely shut out by higher-priority classes.

4. In the **`% Bandwidth Reserved`** field, enter the percentage for each class of service for the uplink (u1) interface. For slot interfaces (s1–s18), this field is not applicable. Since the SCM is defaulted to carry only rt-VBR and UBR traffic, the default for CBR and nrt-VBR is 0%. On the u1 interface, a fixed percent (UBR = 6%) is allocated to the lowest traffic class (UBR) so it is not shut out completely during periods of congestion. The remainder of the bandwidth (94%) is reserved for rt-VBR. Select from a set of numbers shown on the screen (0, 6, 13, 19, 25, 31, 38, 44, 50, 56, 63, 69, 75, 81, 88, 94, or 100).

   **NOTES:**

   — The sum of the bandwidth reservations must equal 100% before you will be allowed to save this configuration. Because of rounding, the sum of the four bandwidths may not add to 100.

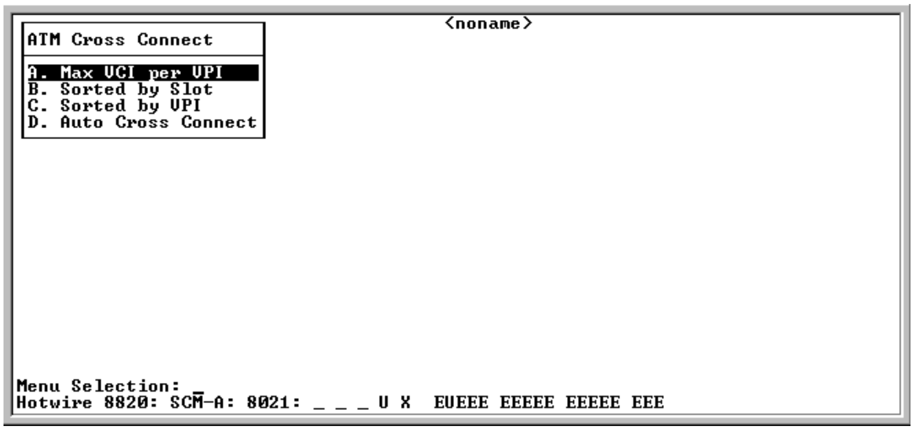
   — Changes will not be allowed if there is not sufficient bandwidth for each service class to support cross connects which have already been accepted.

5. Type **yes** in the **`Save Changes?`** field to save your entries. When making changes, you will not be allowed to save when reducing **`Percent Bandwidth Reserved`** or **`Bandwidth Utilization`** if doing so will cause **`% Bandwidth Assigned`** to exceed 100 percent. The number displayed in the **`% Bandwidth Assigned`** and **`Bandwidth Remaining`** fields are not configurable and is based on the number of connections already created and admitted for that particular service class.

## ATM Cross Connect Menu

To access the ATM Cross Connect menu, follow this menu selection sequence:

*Configuration→ATM Switch →ATM Cross Connect* (**A-E-B**)



```
                                         <noname>
 ATM Cross Connect

 A. Max VCI per VPI
 B. Sorted by Slot
 C. Sorted by VPI
 D. Auto Cross Connect








Menu Selection: _
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The ATM Cross Connect menu provides the following selections:

- **A. Max VCI per VPI** – Defines the maximum Virtual Channel Identifier (VCI) supported by each of the uplink's Virtual Path Identifiers (VPIs).
- **B. Sorted by Slot** – Creates or modifies a VC with presentation sorted by slot number.
- **C. Sorted by VPI** – Creates or modifies a VC with presentation sorted by VPI number.
- **D. Auto Cross Connect** – Defines parameters used to automatically generate a cross connect table.

See Table 4-6, ATM Switch Menu Options, for information about the options available from the ATM Cross Connect menu. Appendix B, *Port Mapping Table*, contains a port mapping table showing the default VPI/VCI values assigned to circuits on the ATM SDSL port card and the SCM card for data and voice service.

## Assigning Maximum VCIs per VPI

Use the Max VCI per VPI screen (**A-E-B-A**) to assign the maximum VCI number that will be supported by each of the uplink's VPIs that are assigned for use.

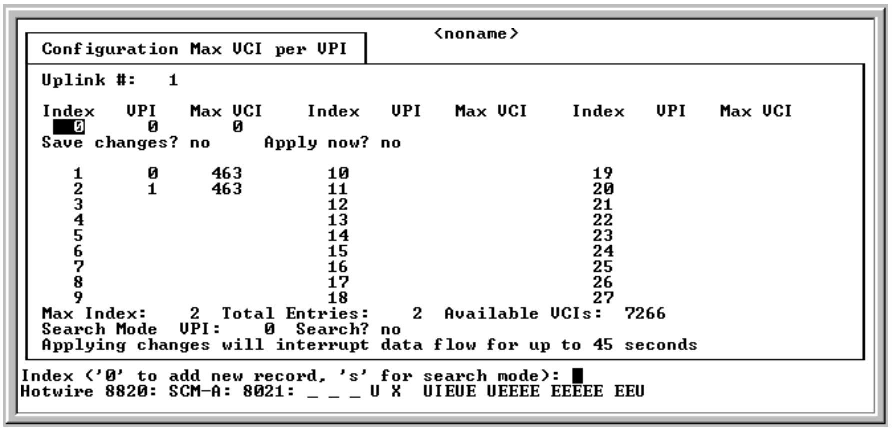
### ▶ Procedure

To assign VCIs per VPI:

1. Follow this menu selection sequence:

   *Configuration→ATM→Max VCI per VPI* (**A-E-B-A**)

   The Max VCI per VPI screen appears. See Table 4-6, ATM Switch Menu Options.



```
                                         <noname>
 Configuration Max VCI per VPI
 Uplink #:   1

 Index   VPI   Max VCI    Index   VPI   Max VCI    Index   VPI   Max VCI
    0     0       0
 Save changes? no     Apply now? no

    1     0     463        10                         19
    2     1     463        11                         20
    3                      12                         21
    4                      13                         22
    5                      14                         23
    6                      15                         24
    7                      16                         25
    8                      17                         26
    9                      18                         27
 Max Index:    2  Total Entries:    2  Available VCIs:  7266
 Search Mode  VPI:    0  Search? no
 Applying changes will interrupt data flow for up to 45 seconds
Index ('0' to add new record, 's' for search mode): █
Hotwire 8820: SCM-A: 8021: _ _ _ U X  UIEUE UEEEE EEEEE EEU
```

2. At the **`Index`** prompt, type the index number of the item you wish to modify, or type **0** to create a new record.
3. In the **`VPI`** field, enter the number of any VPI supported by the uplink (0-255).
4. In the **`Max VCI`** field, enter the maximum VCI that will be supported by the VPI on this uplink (1–8191). This number is limited by the number of VCIs already assigned as shown in the **`Available VCIs`** field.
5. Type **yes** in the **`Save Changes?`** field to save your entries.
6. Type **yes** in the **`Apply Now?`** field after you have changed and saved entries for all VPIs to activate all changes. In this way the data flow is interrupted only once. Data flow is interrupted for up to 45 seconds when applying changes.

## Creating Manual Cross Connections

Use the ATM Cross Connect screen (**A-E-B**) to manually create connections between the uplink and a port card.

### ▶ Procedure

To manually assign cross connections:

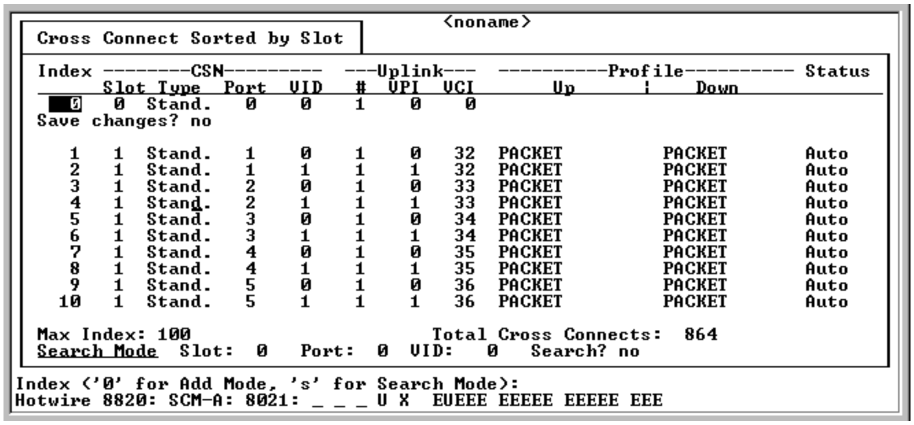
1. Follow this menu selection sequence to assign VCIs sorted by slot:

   *Configuration→ATM→Cross Connect →Slot* (**A-E-B-B**)

   Follow this menu selection sequence to assign VCIs sorted by VPI:

   *Configuration→ATM→Cross Connect →VPI* (**A-E-B-C**)

   The Configuration Cross Connect screen appears. See Table 4-6, ATM Switch Menu Options.



```
                                         <noname>
 Cross Connect Sorted by Slot

 Index --------CSN---------  ---Uplink---  ----------Profile----------  Status
       Slot Type  Port  VID    #  VPI  VCI         Up       ¦   Down
    0   0  Stand.   0    0    1    0    0
 Save changes? no

    1   1  Stand.   1    0    1    0   32  PACKET         PACKET        Auto
    2   1  Stand.   1    1    1    1   32  PACKET         PACKET        Auto
    3   1  Stand.   2    0    1    0   33  PACKET         PACKET        Auto
    4   1  Stand.   2    1    1    1   33  PACKET         PACKET        Auto
    5   1  Stand.   3    0    1    0   34  PACKET         PACKET        Auto
    6   1  Stand.   3    1    1    1   34  PACKET         PACKET        Auto
    7   1  Stand.   4    0    1    0   35  PACKET         PACKET        Auto
    8   1  Stand.   4    1    1    1   35  PACKET         PACKET        Auto
    9   1  Stand.   5    0    1    0   36  PACKET         PACKET        Auto
   10   1  Stand.   5    1    1    1   36  PACKET         PACKET        Auto

 Max Index: 100                      Total Cross Connects:  864
 Search Mode  Slot:  0   Port:  0  VID:   0   Search? no
Index ('0' for Add Mode, 's' for Search Mode):
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

2. At the **`Index`** prompt, type **0** to create a new record. Or, type the index number of the item you wish to modify. You can also enter **s** for Search mode.

   **NOTE:**

   If you attempt to enter a VPI/VCI in the range allocated for default channels, you will get an error message.

3. Enter the slot number (1–18) of the port card at the **`Slot`** prompt.

4. At the **`Type of Cross Connect (Standard/Custom)`** prompt, type **c** for Custom to define VNID bridge groups to packet port cards, or connections in addition to default connections to cell port cards. Use custom connects in the following circumstances.

   — More than two connections per port. Additional connections must be configured.

   — Upgrading from version 1.0 to 1.1 or greater and keeping current connections, use custom connects to build additional standard connections for voice.

   — To add VNIDs for bridged connections to port cards with an ATM uplink.

5. At the **`VID`** prompt, do one of the following:

   — For more than two connections per port, you must first configure the ATM cell card Connection Serial Number (CSN). Ensure that the cross connection is entered for the port card. Then on the SCM card, enter the same CSN sequence value (2–255). This value is used to make the connection through the system at the **`CSN/VNID`** prompt. The total CSN consists of slot (01–18), connection type (S for Standard or C for Custom), port (01–24), and a system-assigned 3-digit sequence number. For custom connections, the port number is supplied (0). For standard connections, enter the port number.

   — For additional custom connections for voice applications, enter the CSN as it appears on the ATM cell card's ATM Cross Connect screen (**A-E-B**). (Before entering the CSN for cell port cards, the matching connection must first be configured on the cell port card. See the *Hotwire ATM Line Cards User's Guide* for more information.) After ensuring that the cross connection is added for the ATM cell card, then enter the cross connection for the SCM card.

   — For custom connections to ATM packet port cards, enter the VNID number (2–255) for Bridged connections as the VID number in the SCM Cross Connects table. The **VNID** number on the ATM packet port card must be defined.

6. Enter the number of the uplink VPI at the prompt. Allowable VPIs are determined by the entries on the Max VCI per VPI screen (**A-E-B-A**).

7. Enter the number of the uplink VCI at the prompt. The maximum value allowed is determined by what is configured on the Max VCI per VPI screen (**A-E-B-A**).

8. Enter the upstream traffic profile name as defined on the ATM Traffic Profiles screen (**A-E-C**). See *Creating ATM Traffic Profiles* on page 4-33 for more information on traffic profiles. For symmetric traffic, enter the same traffic profile for downstream, or accept the default (if shown). For asymmetric traffic, you must enter a different downstream profile.

   **NOTE:**

   Use Crtl-v to display a list of valid traffic profiles. Ctrl-x scrolls down the list and Crtl-w scrolls up the list.

9. In the **`Status`** field, enter **Enable** to enable the selected connection, **Disable** to disable the selected connection, or **Delete** to delete the connection on the port card.

10. Type **yes** in the **`Save Changes?`** field to save your entries.

## Modifying Manual Cross Connections

### ▶ Procedure

To modify cross connections:

1. Follow this menu selection sequence to assign VCIs sorted by slot:

   *Configuration→ATM→Cross Connect →Slot* (**A-E-B-B**)

   Follow this menu selection sequence to assign VCIs sorted by VPI:

   *Configuration→ATM→Cross Connect →VPI* (**A-E-B-C**)

   The Configuration Cross Connect screen appears. See Table 4-6, ATM Switch Menu Options.

2. At the **`Index`** prompt, type the index number of the item you wish to modify.

3. Modify the traffic profile name.

   — Only the traffic profile name associated with this cross connect can be modified. You must delete, then recreate cross connections to choose any other field.

4. Type **yes** or **no** in the **`Delete?`** field.

5. Type **yes** in the **`Save Changes?`** field to save your entries.

## Creating Auto Cross Connections

Use the Auto Cross Connect screen to automatically allocate Standard cross connections (**A-E-B-D**). The settings on this screen inform the SCM how to automatically assign SCM cross connects between the uplink and the port cards when the SCM is reset or first powers-on. Based on this screen, the SCM allocates connections for each channel type specified. In this case, a channel is a set of default connections between the uplink and the link to each port card slot. The SCM starts with the base VCI number and allocates 24 possible connections to each slot for each channel defined. However, these connections are not made until a port card is installed in the slot. Once a port card is installed, it relays a message to the SCM (via the MCP) detailing how many ports that port card has and how many and what type of default cross connects the port card expects the SCM to build.

Auto cross connections are only generated when the SCM powers-on or the cross connect table is deleted and the SCM card reset.

**NOTE:**

Although cross connections for up to 24 ports are built, the system only activates the ports that are required when the card is installed in the chassis. Channels 0 and 1 are set by default to start at VPI=0, VCI=32. Channels 2 and 3 do not have defaults.

### ▶ Procedure

**NOTE:**

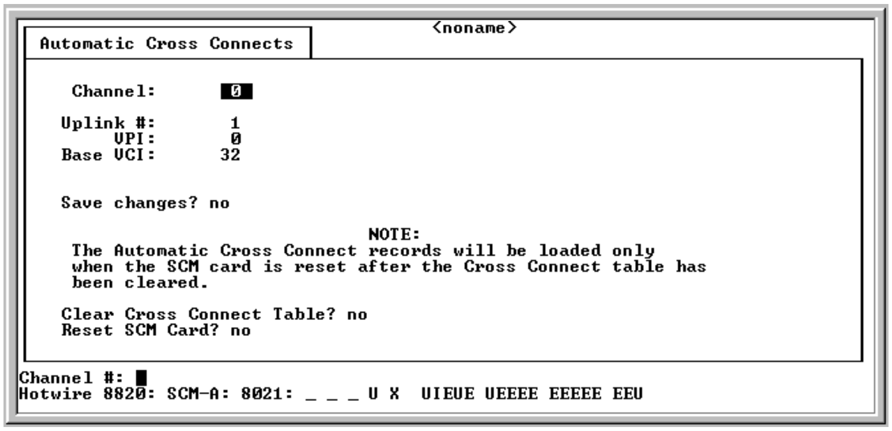
Auto cross connections are only created during initial system setup or by clearing the cross connect table and resetting the SCM.

To assign automatic cross connect parameters:

1. Follow this menu selection sequence:

   *Configuration→ATM Switch →ATM Cross Connects → Auto Cross Connect* (**A-E-B-D**)

   The Configuration Automatic Cross Connects screen appears. See Table 4-6, ATM Switch Menu Options.



```
 Automatic Cross Connects              <noname>

   Channel:       0

  Uplink #:       1
       VPI:       0
  Base VCI:      32


  Save changes? no

                              NOTE:
   The Automatic Cross Connect records will be loaded only
   when the SCM card is reset after the Cross Connect table has
   been cleared.

  Clear Cross Connect Table? no
  Reset SCM Card? no

Channel #: █
Hotwire 8820: SCM-A: 8021: _ _ _ U X  UIEUE UEEEE EEEEE EEU
```

2. At the **`Enter a number between 0 and 7 for the default group:`** prompt, type **0, 1**, **2**, **3, 4, 5, 6,** or **7** for the Channel #.
3. At the **`Enter a number between 0 and max VPI configured for uplink:`** prompt, enter the number of the uplink VPI (0–255) to be used for all connections defined for the specified channel (Channel 0 Default = 0, Channel 1 Default = 1).
4. At the **`Enter a number between 1 and max VCI configured for uplink/VPI:`** prompt, enter the starting VCI value used for automatic cross connects (1 – max VCI).
5. Type **yes** in the **`Save Changes?`** field to save your entries. You should clear all existing cross connections.

## CAUTION:

**If the cross connect table is cleared, all service data flow through the SCM will stop. Inband management data remains flowing.**

6. If desired, type **yes** in the **`Clear Cross Connect Table?`** field to immediately remove all previously created cross connections.
7. Type **yes** in the **`Reset SCM Card?`** field to load cross connect records.

## Creating ATM Traffic Profiles

You can create, edit or delete user-created traffic profiles. However, you cannot edit a traffic profile that is assigned to one or more cross connections nor can you edit the PACKET default profile. You can also edit other default profiles, but you cannot change their names. To edit a traffic profile that has been assigned to a cross connection, either:

- Delete all cross connections using that profile, edit the traffic profile, then rebuild new cross connections, or
- Define a new traffic profile, then edit the cross connection to replace the old traffic profile with the new one.

To delete a traffic profile, make the profile name a blank field.

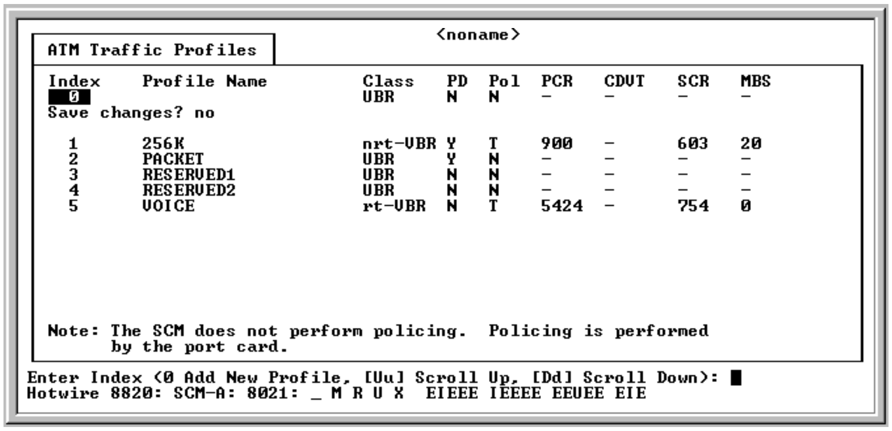
### ▶ Procedure

To create traffic profiles for different types of connections:

1. Follow this menu selection sequence:

   *Configuration→ATM Switch→ATM Traffic Profiles* (**A-E-C**)

   The ATM Traffic Profiles screen appears. See Table 4-6, ATM Switch Menu Options. Traffic profiles are displayed alphabetically, with all uppercase profiles (default profiles) displayed first, followed by lowercase profiles.



```
                                        <noname>
 ATM Traffic Profiles
 Index     Profile Name             Class    PD   Pol  PCR    CDVT    SCR    MBS
   0                                UBR      N    N    -      -       -      -
 Save changes? no

   1       256K                     nrt-VBR Y    T    900    -       603    20
   2       PACKET                   UBR     Y    N    -      -       -      -
   3       RESERVED1                UBR     N    N    -      -       -      -
   4       RESERVED2                UBR     N    N    -      -       -      -
   5       VOICE                    rt-VBR  N    T    5424   -       754    0

 Note: The SCM does not perform policing.  Policing is performed
       by the port card.
Enter Index (0 Add New Profile, [Uu] Scroll Up, [Dd] Scroll Down>: █
Hotwire 8820: SCM-A: 8021: _ M R U X  EIEEE IEEEE EEUEE EIE
```

2. At the **`Index`** prompt, type the index number of the item you wish to modify, or type **0** to create a new record.
3. Enter a profile name using up to 12 ASCII characters. Default profiles are indicated by uppercase letters.
4. At the **`Choose Class`** prompt, enter the desired class for the connection (**CBR/rt-VBR/nrt-VBR/UBR**). See Table 4-6, ATM Switch Menu Options, for class definitions and priority levels.
5. At the **`Enable Packet Discard (Y/N)`** prompt, enter **Y** (yes) or **N** (no).

6. At the `Enable Policing` prompt, enter **T** (Tagged), **D** (Dropped) or **N** (Not) to indicate whether the traffic has been policed (tagged or dropped) or not by the ATM port card. Policing is not performed by the SCM card.
7. At the `Enter PCR Value` prompt, enter the peak cell rate (supported by the DSL line).
8. At the `Enter CDVT Value` prompt, enter the cell delay variation tolerance in microseconds.
9. At the `Enter SCR Value` prompt, enter the sustained cell rate (supported by the DSL line).
10. At the `Enter MBS Value` prompt, enter the maximum burst size (supported by the DSL line).
11. Type **yes** to save your changes.

## Traffic Profile Management

It is recommended that traffic profile management be handled with Paradyne's OpenLane® Network Management System. There are a limited number of traffic profiles available (250), therefore it is recommended that the same set of profiles be used across the Hotwire GranDSLAM network.

## Clearing Cross Connections

Use Clear X Connects to clear all cross connections and prepare the card for a new set of Auto Configuration connections in case you want to use the card for a different purpose or if the cross connect table will be completely user-defined.

### ▶ Procedure

To clear all cross connects:

1. Follow this menu selection sequence to clear all of the cross connects on an interface:

   *Configuration→ATM Switch→Clear X Connects* (**A-E-D**)

2. At the `Clear Cross Connects` prompt, type **yes** to clear the all cross connects on the selected interface except inband management. Type **no** to exit this screen without clearing the cross connects.

## ATM Switch Menu Options

For ATM Switch menu options, refer to Table 4-6, ATM Switch Menu Options. To access the ATM Switch menu, follow this menu selection sequence:

*SCM Main Menu*→*Configuration*→*ATM Switch* (**A-E**)

**Table 4-6. ATM Switch Menu Options (1 of 7)**

| **ATM Parameters**<br>**Max VPI** **A-E-A-A** |
|---|
| Defines the maximum VPI supported by the uplink. This screen is read-only.<br>**Uplink #** – Displays 1. (This field is read-only.)<br>**Maximum VPI** – Displays the maximum VPI value supported by this uplink (255). A value of 255 means that all VPI values from 0 through 255 are valid. (This field is read-only.) |

**Table 4-6. ATM Switch Menu Options (2 of 7)**

| ATM Parameters<br>Bandwidth Mgmt (ATM Bandwidth Management) | A-E-A-B |
|---|---|

Defines the parameters that affect how new VCs of various classes of ATM traffic are admitted to the SCM card, as well as how these traffic classes are serviced during periods of congestion (bandwidth reservation). These parameters apply no matter how many VCCs are defined for the port.

**Interface Name** – Enter s1–s18 for Slots 1–18 (depending on chassis type), or u1 for Uplink 1. Defines the interface that the Bandwidth Utilization parameters are applied to.

**Interface Speed** – Displays the actual speed of the interface in cells per second and kilobits per second.

**Service Class** – Displays the class of service for this connection. Cells are switched based on priority of the service class. (This field is read-only.) Classes listed below in priority order (highest to lowest):

- CBR = Constant Bit Rate
- rt-VBR = Real Time Variable Bit Rate for voice traffic
- nrt-VBR = Nonreal Time Variable Bit Rate for data traffic with a service commitment, such as Frame Relay traffic
- UBR = Unspecified Bit Rate for packet data

**Bandwidth Utilization** – Enter the percent of bandwidth utilization (oversubscription) the CAC will allow for each service class:

- CBR = Set to 100%. (This field is read-only.)
- rt-VBR = Enter 0–9999 (Default = 200% for u1, 100% for s1–s18).
- nrt-VBR Enter 0–9999 (Default = 200% for u1, 100% for s1–s18).
- UBR = Not applicable.

**% Bandwidth Reserved** – For u1, allows you to specify the percentage of uplink or cell bus bandwidth allocated for each traffic class (rt-VBR and nrt-VBR). Since the SCM card is defaulted to carry only rt-VBR and UBR traffic, the defaults for CBR and nrt-VBR classes is 0%. The sum of the bandwidth reservations must equal 100% before you will be allowed to save the configuration. The system will not allow you to lower % Bandwidth Reserved or Bandwidth Utilization to a value that would result in % Bandwidth Assigned to be greater than 100. This field is read-only for s1–s18.

**% Bandwidth Assigned** – Displays the current bandwidth used by existing cross connections of each service class. (This field is read-only.)

**Bandwidth Remaining (cells/s)** – The bandwidth available to allocate new connections for each service class.

**Number of Connections** – The number of connections assigned to each service class.

**Accepting New Connections** – Displays whether new connections can be added for each service class.

**Save changes?** – Type yes or no.

**Table 4-6. ATM Switch Menu Options (3 of 7)**

| **ATM Cross Connect**<br>**Max VCI per VPI** **A-E-B-A** |
|---|
| Allows you to assign the maximum number of VCIs to be supported by each of the uplink's VPIs. If a VPI has not been assigned any VCIs, it is not displayed on this screen. The total number of VCIs that can be assigned to all the uplink's VPIs is 8192. Be sure to enter and save all changes before disrupting data flow by applying them.<br>NOTE: Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.<br>**Uplink #** – Displays 1. (This field is read-only.)<br>**Index** – Enter the index number of the item you wish to modify, or enter **0** to create a new entry. Enter **s** to perform a search.<br>**VPI** – The number of any VPI supported by the uplink – 0–255 (Default = 0).<br>**Max VCI** – The maximum VCI value that will be supported by the VPI on this uplink – 1–8191 (Default = 0 for all except VPI 0 and VPI 1. Default for VPI 0 and VPI 1 = 463).<br>**Max Index** – Displays the total number of entries in the index. The first entry in the index is determined by your search. The total number of entries possible in the index is a maximum of 100 or up to the end of the database, whichever comes first. The number displayed in this field determines the largest number that you may enter into the Index field at the bottom of the screen. (This field is read-only.)<br>**Save changes?** – Type yes or no. Changes will not take effect until applied by selecting yes in the Apply Now? field.<br>**Apply Now?** – Type yes or no. Selecting yes will disrupt data flow for up to 45 seconds. It is recommended that you make all Max VCI changes, saving each, then apply once when finished.<br>**Total Entries** – Displays the total number of uplink VPIs that have been assigned at least one VCI. (This field is read-only.)<br>**Available VCIs** – Displays the number of VCIs that have not already been assigned to a VPI (Maximum = 8192). (This field is read-only.)<br>**Search Mode** – Allows you to search the database for VPI records to display.<br>**VPI** – Enter the number of the VPI record you wish to display. The database display will start with this VPI record.<br>**Search?** – Enter Yes to start a search of the database, beginning with the record you defined in the VPI field. |

**Table 4-6. ATM Switch Menu Options (4 of 7)**

**ATM Cross Connect**
**Sorted by Slot (ATM Cross Connects Sorted by Slot) A-E-B-B**
**Sorted by VPI (ATM Cross Connects Sorted by VPI) A-E-B-C**

Gives you the ability to map the connectivity between DSL port card ports and uplink VPI/VCIs. You can display VCIs sorted by slot (**A-E-B-B**) or by VPI (**A-E-B-C**); the fields displayed are the same, the only difference is the order in which they are presented. The list of fields below is presented in the order shown on the ATM Cross Connects Sorted by Slot (**A-E-B-B**) screen.

NOTES:

- Ensure that the parameters entered here for the SCM card are consistent with those entered for the DSL port card. See the *Hotwire MVL, ReachDSL/MVL, RADSL, IDSL, and SDSL Cards User's Guide* for information on configuring DSL port cards.
- Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.

**Index** – Enter the index number of the item you wish to modify or delete, or enter **0** to create a new entry.

**CSN** – The following fields define the Connection Serial Number (CSN) used for making the connection through the system. The format is slot (1–18), connection type (Standard or Custom), port (1–24), system-assigned sequence number. For cell port cards (e.g., ATM), the VID is the last part of the CSN given by the port card (it is an internal VC).

**Slot** – The slot number (1–18, depending on chassis type) of the DSL port card associated with the connection.

**Type** – Defines the cross connection type as:

- Standard = Port maps to its own uplink VPI/VCI and is automatically assigned a dedicated internal VNID/VPI/VCI.
- Custom = Define VNID bridge groups to packet port cards, or connections in addition to standard connections to cell port cards.

**Port** – The number of the port (1–24, depending on port card type) associated with the connection. This field is not used for Custom connections (Type = Custom), since custom connections can be associated with more than one port.

**VID** – For connections to packet port cards, the number used to identify the bridged connection (0–255). Each VNID number can be used to identify only one bridged connection on a port card, but this connection can be associated with more than one of that DSL port card's ports. The same VNID number can be used by multiple DSL port cards.

**Uplink** – The following fields define the uplink:

**#** – Displays 1. (This field is read-only.)

**VPI** – The number of the uplink VPI (0–255) associated with the connection.

**VCI** – The number of the uplink VCI associated with the connection (1–maximum VCI). The maximum value allowed is determined by what was configured on the Max VCI per VPI screen (**A-E-B-A**).

**Table 4-6. ATM Switch Menu Options (5 of 7)**

| **ATM Cross Connect**<br>**Sorted by Slot (ATM Cross Connects Sorted by Slot) A-E-B-B**<br>**Sorted by VPI (ATM Cross Connects Sorted by VPI) A-E-B-C**<br>***(continued)*** |
|---|
| **Profile** – The following fields bind one or two of the predefined traffic profiles (**A-E-C**) to the cross connection. The default is PACKET. Each profile name entered is verified against the set of traffic profile names defined on the ATM Traffic Profiles screen (**A-E-C**). Profile names are case-sensitive. Type Ctrl-v to display a list of predefined profiles.<br>**Up** – Used for upstream profiles (port card to SCM). It is not an indication that the port on the DSL port card is up.<br>**Down** – Used for downstream profiles (same as upstream for symmetric data).<br>**Status** – Displays the status of the connection:<br>– Up = A valid cross connection has been defined and a DSL port card matching the the connection's parameters exists in the chassis.<br>– Down = A valid cross connection has been defined, but there is no card in the slot defined by the cross connection, and this is a user- or SNMP-initiated connection or an Auto connection that has had an Up status since the SCM card was last reset.<br>– CfgErr = A valid cross connection has been defined, but the port card in the slot defined by the cross connection is not compatible with the SCM card operation or is not consistent with what is entered in the Port field. Also, this is a user- or SNMP-initiated connection or an Auto connection that has had an Up status since the SCM card was last reset.<br>– Auto = A valid auto cross connection has been defined, but the slot associated with the Auto connection is empty or contains a card that is inconsistent with the defined Auto connection, and this connection has not achieved an Up status since the last time the SCM card was reset. The Auto status will change to Up once a port card consistent with the defined Auto connection is inserted in this slot. Once this connection achieves an Up status, it will never again assume Auto status unless the SCM card is reset.<br>**Max Index** – Displays the total number of entries in the index. The first entry in the index is determined by your search. The total number of entries possible in the index is a maximum of 100 or up to the end of the database, whichever comes first. The number displayed in this field determines the largest number that you may enter into the Index field at the bottom of the screen. (This field is read-only.)<br>**Total Cross Connects** – The number of user connections defined for this uplink.<br>**Search Mode** – Enter s in the Index field to start the search. Enter the Slot, Port and VID numbers, then yes to search. The entry found in the search moves to the top of the list.<br>**Delete?** – Type yes in this field and yes in the Save Changes field to delete the selected item/record. This field only appears when you enter an Index number other than 0 in the Index field. |

**Table 4-6. ATM Switch Menu Options (6 of 7)**

| **ATM Cross Connect**<br>**Auto Cross Connect (Automatic Cross Connects) A-E-B-D** |
|---|
| Defines the parameters used to generate an Automatic Cross Connect table. All connections in this table will be in Standard mode. This table is automatically loaded and used when the Cross Connect table is cleared and the SCM card is reset.<br>NOTE: Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.<br>**Channel #** – Enter 0–7.<br>**Uplink #** – Displays 1. (This field is read-only.)<br>**VPI** – Enter the number of the VPI used for all connections defined by the Automatic Cross Connect table (Channel 0 Default = 0, Channel 1 Default = 1).<br>**Base VCI** – Enter the starting VCI value used for the automatic cross connects (1 – max VCI). Default = 32.<br>**Save changes?** – Type yes or no. The Automatic Cross Connect records will be loaded only when the SCM card is reset after the Cross Connect table has been cleared.<br>**Clear Cross Connect Table?** – Type yes to clear the Cross Connect Table of all connections except for Inband Management.<br>**Reset SCM Card?** – Type yes to reset the SCM card. |

**Table 4-6. ATM Switch Menu Options (7 of 7)**

**ATM Traffic Profiles** **A-E-C**

Allows you to specify all the traffic contract parameters for a particular type of connection. You can use the default profiles or create new profiles. Up to 250 profiles are supported. These profiles are intended to make configuration of port cards with an ATM network interface simpler.

Traffic profiles are displayed alphabetically with uppercase profiles (usually the default profiles) displayed first, followed by lowercase profiles.

**Index** – Enter the index number of the item you wish to modify, or enter **0** to create a new entry.

**Profile Name** – Specifies the name of the traffic profile. Enter up to 12 ASCII characters. Default profiles are indicated by uppercase letters (PACKET, VOICE, RESERVED). PACKET allows for TCP/IP-type services when using the UBR service VOICE allows for voice services (AAL2 using the rt-VBR service class). You cannot edit the PACKET profile. You can edit the other default profiles, but you cannot change their names. If you attempt to do so, the name becomes **NAME***.

**Class** – Specifies the class of service for this connection. Cells are switched based on priority of the service class. Classes listed below in priority order (highest to lowest):

- CBR = Constant Bit Rate
- rt-VBR = Real Time Variable Bit Rate. (i.e., voice traffic)
- nrt-VBR = Nonreal Time Variable Bit Rate for data traffic with a service commitment, such as Frame Relay.
- UBR = Unspecified Bit Rate for packet data

**PD** – (Yes/No). Determines if the SCM card should use the Packet Discard feature when congestion is detected. Valid only for traffic with packet data using AAL5.

**POL** – Indicates the type of policing supplied by the ATM SDSL port card if the SCM card and the ATM SDSL port card have the same traffic profile. (The SCM card does not perform policing):

- N = None. The ATM SDSL port card will not provide policing.
- T = Tag. Nonconforming cells are tagged and forwarded to the SCM card with the CLP bit set.
- D = Drop. Nonconforming cells are dropped by the ATM SDSL port card.

**PCR** – (0–52,734). Enter the Peak Cell Rate (PCR). The maximum is approximately 22 Mbps.

**CDVT** – (0–156,000). Enter the Cell Delay Variation Tolerance (CDVT) in microseconds.

**SCR** – (0–PCR). Enter the Sustained Cell Rate (SCR).

**MBS** – (1–99,999). Enter the Maximum Burst Size (MBS) in number of cells.

**Total Profiles** – The number of profiles that have been defined.

**Clear X Connects (Clear Cross Connects)** **A-E-D**

Allows you to clear all cross connections except inband management from nonvolatile memory. Default connections and traffic profiles will be restored upon SCM card reset. To delete the connection from the system, you also need to delete the connections on all ATM SDSL port cards.

# Monitoring Menu Options

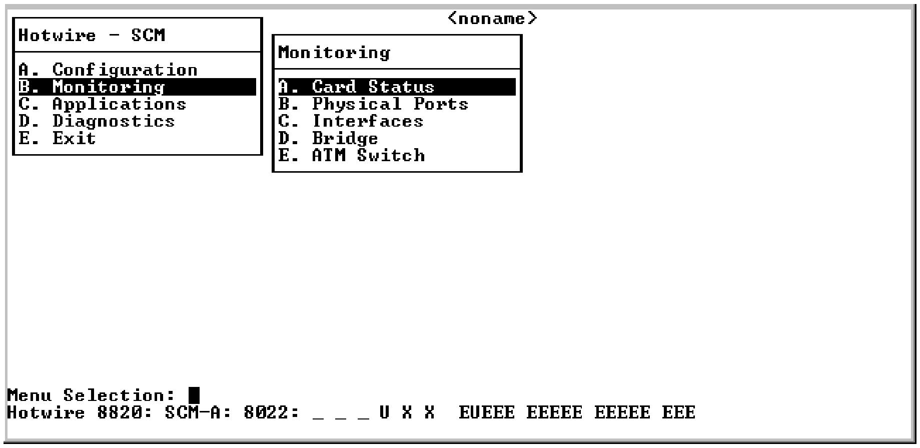
# 5

## Overview

This chapter describes the options on the Monitoring menu of the SCM card. The Hotwire GranDSLAM lets you monitor all cards in the system. You monitor SCM, DSL and MCP card operations by selecting various options from the Monitoring menu. To access the Monitoring menu, follow this menu selection sequence:

*SCM Main Menu → Monitoring*

The Monitoring menu appears.



```
Menu Selection: █
Hotwire 8820: SCM-A: 8022: _ _ _ U X X  EUEEE EEEEE EEEEE EEE
```

This chapter presents information on how to access these menus and their submenus to monitor card status and performance statistics.

**NOTE:**

Most Monitoring menus are read-only. The information helps you gather pertinent data and isolate potential problems. For information about monitoring and troubleshooting specific DSL cards, see the *Hotwire MVL, ReachDSL/MVL, RADSL, IDSL, and SDSL Cards User's Guide.*

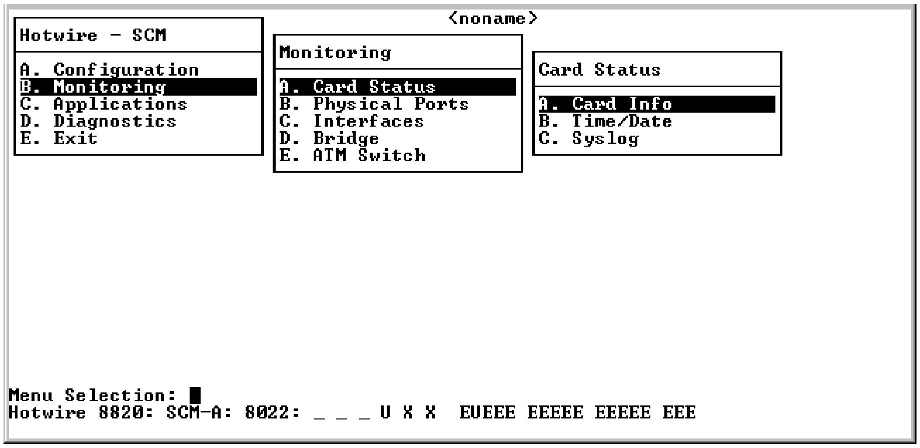
| Select . . . | To Access the . . . | To Display . . . |
|---|---|---|
| **A. Card Status** | Monitoring Card Information Screen (Table 5-1) | ■ SCM card information |
| | Time and Date Screen (Table 5-2) | ■ Current time and date |
| | Syslog Screen | ■ Syslog |
| **B. Physical Ports** | Monitoring Uplink Parameters Screens (Table 5-3) | ■ Uplink parameters |
| | Monitoring IMA Link Parameters Screen (Table 5-4) and Monitoring IMA Group Parameters Screen (Table 5-5) | ■ IMA parameters |
| | Monitoring Uplink Statistics Screens (Table 5-6) | ■ Uplink statistics |
| | DS1/E1 Uplink Statistics Screen (Table 5-7) and IMA Uplink Statistics Screen (Table 5-8) | ■ IMA statistics |
| | Monitoring IMA Status Screen (Table 5-9) | ■ IMA status |
| | Ethernet Statistics Screen (Table 5-10) | ■ Ethernet statistics |
| **C. Interfaces** | Inband Management Parameters Screen (Table 5-11) | ■ Inband management channel parameters |
| | Ethernet Statistics Screen (Table 5-12) | ■ Ethernet statistics |
| | Protocol over ATM Statistics Screen (Table 5-13) | ■ Inband management Multi-Protocol over ATM (MPOA) statistics |
| | Inband Mgt AAL5 SAR Statistics Screen (Table 5-14) | ■ Inband management AAL5 SAR statistics |
| | Active Interfaces List Screen (Table 5-15) | ■ List of active interfaces |
| | Interface Status Screen (Table 5-16) | ■ Interface status and statistics |
| **D. Bridge** | SCM Bridge Parameters Screen (Table 5-17) | ■ Bridge Forwarding Table parameters |
| | Bridge MAC Table Screen (Table 5-18) | ■ Bridge MAC Table entries |

| Select . . . | To Access the . . . | To Display . . . |
|---|---|---|
| **E. ATM Switch** | Monitoring ATM Max VPI Screen (Table 5-19), and ATM Bandwidth Management Screen (Table 5-20) | ■ ATM parameters (Max VPI and Bandwidth Management) |
| | Monitoring Max VCI per VPI Screen (Table 5-21), Cross Connect Screens (Table 5-22), and ATM Automatic Cross Connects Screen (Table 5-23) | ■ ATM Cross Connects |
| | ATM Traffic Profiles Screen (Table 5-24) | ■ ATM Traffic Profiles |
| | ATM Uplink Aggregate Statistics Screen (Table 5-25), ATM Uplink VPI Statistics Screen (Table 5-26), ATM Slot Statistics Screen (Table 5-27), ATM Connection Statistics Screen (Table 5-28), and Buffer Stats Screen (Table 5-29) | ■ Statistics (Uplink Aggregate, Aggregate VPI Number, Aggregate Slot, Individual Connection, and Buffer) |
| | ATM Unknown Cells Screen (Table 5-30) | ■ Unknown Cells |

# Card Status Menu Options

To access the Card Status menu, follow this menu selection sequence:

*SCM Main Menu→Monitoring→Card Status* (**B-A**)



```
                                    <noname>
Hotwire - SCM
                       Monitoring
A. Configuration                              Card Status
B. Monitoring          A. Card Status
C. Applications        B. Physical Ports      A. Card Info
D. Diagnostics         C. Interfaces          B. Time/Date
E. Exit                D. Bridge              C. Syslog
                       E. ATM Switch

Menu Selection: █
Hotwire 8820: SCM-A: 8022: _ _ _ U X X  EVEEE EEEEE EEEEE EEE
```

The Card Status menu provides the following options:

- **A. Card Info** – General card information such as card type, model and serial number, firmware, and hardware version number.
- **B. Time/Date** – The current time and date as set in the MCP card.
- **C. Syslog** – A sequential timestamp list of system operational-type errors and notations, such as alarms.

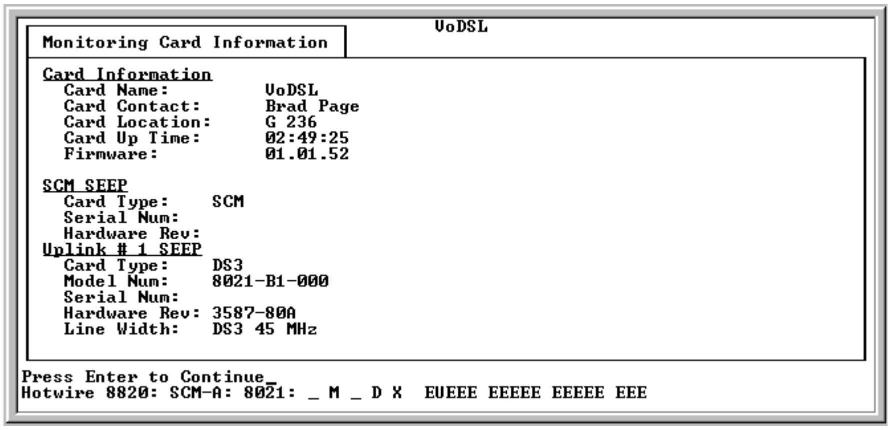
## Displaying Card Information

To display card information, follow this menu selection sequence:

*Monitoring→Card Status→Card Info* (**B-A-A**)

The Monitoring Card Information screen appears. This screen is divided into three sections:

- **Card Information** – Contains general card information.
- **SCM SEEP** (Serial EE PROM) – Contains manufacturer's information about the SCM card.
- **Uplink #1 SEEP** – Contains SEEP information about the uplink childcard.



```
                                            VoDSL
 Monitoring Card Information

 Card Information
   Card Name:          VoDSL
   Card Contact:       Brad Page
   Card Location:      G 236
   Card Up Time:       02:49:25
   Firmware:           01.01.52

 SCM SEEP
   Card Type:     SCM
   Serial Num:
   Hardware Rev:
 Uplink # 1 SEEP
   Card Type:     DS3
   Model Num:     8021-B1-000
   Serial Num:
   Hardware Rev: 3587-80A
   Line Width:    DS3 45 MHz

Press Enter to Continue_
Hotwire 8820: SCM-A: 8021: _ M _ D X  EUEEE EEEEE EEEEE EEE
```

The Monitoring Card Information screen displays the information listed in Table 5-1, Monitoring Card Information Screen.

### Table 5-1. Monitoring Card Information Screen

**Monitoring Card Information** **B-A-A**

**Card Information**

NOTE: Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.

**Card Name** – Name assigned to the card via the Card Information screen (**A-A-A**).

**Card Contact** – Name or number of the person responsible for the card as assigned via the Card Information screen (**A-A-A**).

**Card Location** – Physical location of the system as entered on the Card Information screen (**A-A-A**).

**Card Up Time** – Length of time the SCM card has been running (in days, hours, minutes and seconds).

**Firmware** – Version of firmware.

---

**SCM SEEP** (programmed at factory)

**Card Type** – Code assigned to card (SCM).

**Serial Num** – Serial number of SCM card.

**Hardware Rev** – Version of SCM main card hardware.

---

**Uplink #1 SEEP** (programmed at factory)

**Card Type** – Code assigned to uplink childcard (DS3/OC3/E3/IMA).

**Model Num** – Model number of the uplink childcard:

- 8021 = DS3
- 8022 = OC3 with Multi Mode Fiber (MMF)
- 8023 = OC3 with Single Mode Fiber for immediate (15 km) reach (SMF)
- 8024 = OC3 with Single Mode Fiber for long (40 km) reach (SMF)
- 8025 = E3
- 8026 = DS1 IMA
- 8027 = E1 IMA (75 ohm)
- 8028 = E1 IMA (120 ohm)

**Serial Num** – Serial number of the uplink card.

**Hardware Rev** – Version of uplink childcard's hardware.

**Line Width** – OC3 is 155 Mbps. DS3 is 45 Mbps. E3 is 34 Mbps. Nominal rate of the uplink. This field does not appear for IMA uplinks.

**Line Type** – Uplink line type. For OC3, displays the type of fiber and the nominal drive distance in kilometers. This field does not appear for DS3 or E3 uplinks.

- Model 8022: Multi-Mode Fiber (MMF)= 2 km
- Model 8023: Single Mode Intermediate Reach (SMIR) = 15 km
- Model 8024: Single Mode Long Reach (SMLR) = 40 km
- Model 8026: DS1
- Model 8027: E1 75 ohm
- Model 8028: E1 120 ohm

## Displaying Time/Date

To display the time and date of the Hotwire 8820 GranDSLAM's internal clock, follow this menu selection sequence:

*Monitoring*→*Card Status*→*Time/Date* (**B-A-B**)

The Time/Date screen displays the information listed in Table 5-2, Time and Date Screen.

**Table 5-2. Time and Date Screen**

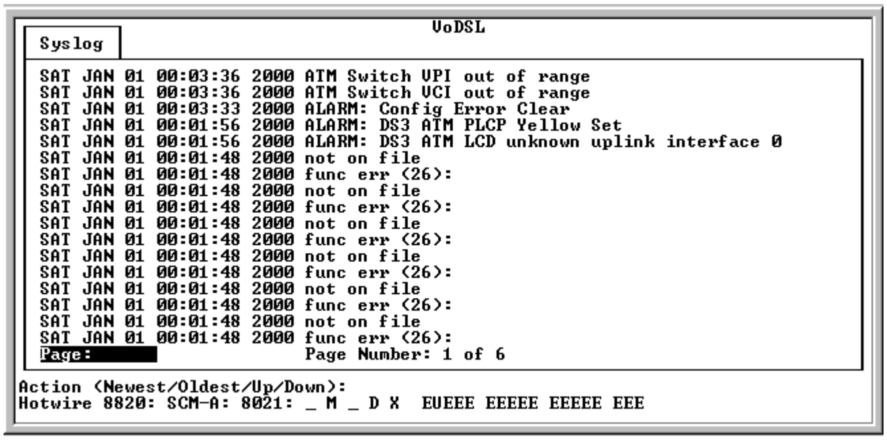
| Time and Date | B-A-B |
|---|---|
| **Timezone** – System's time zone as set on the MCP card.<br>**Time/Date** – Current time and date as set on the MCP card. | |

## Displaying System Log

To display the system log, follow this menu selection sequence:

*Monitoring*→*Card Status*→*Syslog* (**B-A-C**)

The Syslog screen appears.



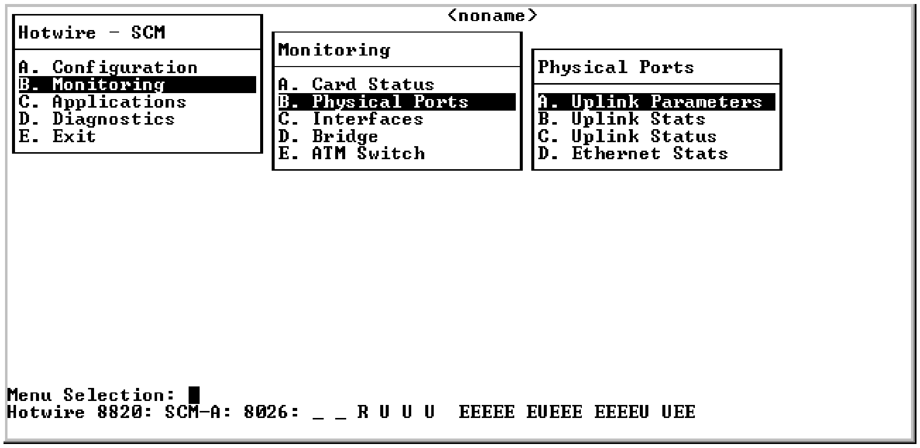
```
                                VoDSL
 Syslog
 SAT JAN 01 00:03:36 2000 ATM Switch VPI out of range
 SAT JAN 01 00:03:36 2000 ATM Switch VCI out of range
 SAT JAN 01 00:03:33 2000 ALARM: Config Error Clear
 SAT JAN 01 00:01:56 2000 ALARM: DS3 ATM PLCP Yellow Set
 SAT JAN 01 00:01:56 2000 ALARM: DS3 ATM LCD unknown uplink interface 0
 SAT JAN 01 00:01:48 2000 not on file
 SAT JAN 01 00:01:48 2000 func err (26):
 SAT JAN 01 00:01:48 2000 not on file
 SAT JAN 01 00:01:48 2000 func err (26):
 SAT JAN 01 00:01:48 2000 not on file
 SAT JAN 01 00:01:48 2000 func err (26):
 SAT JAN 01 00:01:48 2000 not on file
 SAT JAN 01 00:01:48 2000 func err (26):
 SAT JAN 01 00:01:48 2000 not on file
 SAT JAN 01 00:01:48 2000 func err (26):
 SAT JAN 01 00:01:48 2000 not on file
 SAT JAN 01 00:01:48 2000 func err (26):
 Page:                    Page Number: 1 of 6
Action (Newest/Oldest/Up/Down):
Hotwire 8820: SCM-A: 8021: _ M _ D X  EUEEE EEEEE EEEEE EEE
```

The Syslog screen displays a sequential time annotated list of system errors and notations by date and event. There is one logged event per line in a scrolling list (up/down/top/bottom) for up to six pages (approximately 100 entries).

# Displaying Physical Ports Options

To access the ATM menu, follow this menu selection sequence:

*SCM Main Menu→Monitoring→Physical Ports* (**B-B**)



```
                                   <noname>
 Hotwire - SCM
                      Monitoring
 A. Configuration                            Physical Ports
 B. Monitoring        A. Card Status
 C. Applications      B. Physical Ports      A. Uplink Parameters
 D. Diagnostics       C. Interfaces          B. Uplink Stats
 E. Exit              D. Bridge              C. Uplink Status
                      E. ATM Switch          D. Ethernet Stats

Menu Selection:
Hotwire 8820: SCM-A: 8026: _ _ R U U U  EEEEE EUEEE EEEEU UEE
```

The Physical Ports menu provides the following options:

- **A. Uplink Parameters** – Displays the values configured on the Configuration Physical Ports screen (**A-B-A**). The IMA uplink displays the parameters configured on the Link/Port Parameter Configuration screen (**A-B-A-A**) and IMA group information configured on the IMA Group Parameter Configuration screen (**A-B-A-D**).
- **B. Uplink Stats** – Displays accumulated counts for various parameters.
- **C. Uplink Status** – Displays IMA Group status.
- **D. Ethernet Stats** – Displays Ethernet statistics for the internal (Eth1) and External (Eth2) Ethernet ports.

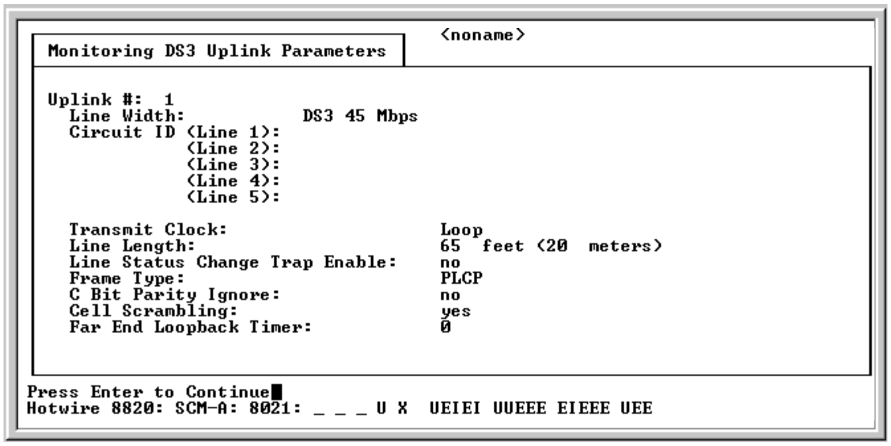
## Displaying Uplink Parameters

To display the parameters that define the operation of the uplink (either DS3, OC3, or E3), follow this menu selection sequence:

*Monitoring→Physical Ports→Uplink Parameters* (**B-B-A**)

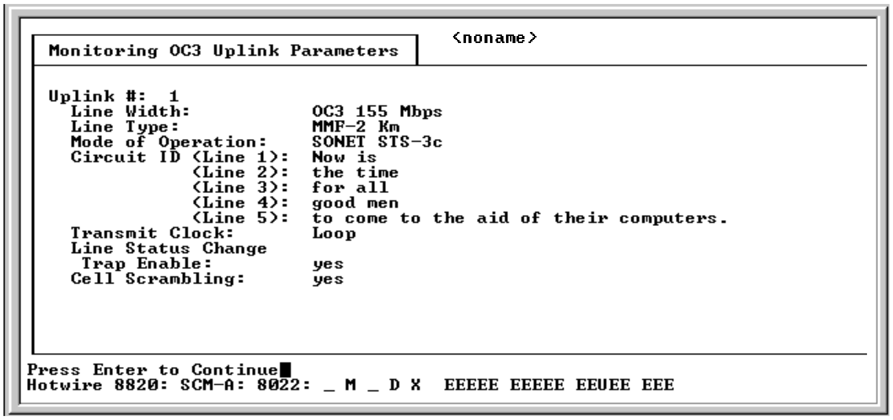
The Monitoring Uplink Parameters screen appears. This screen differs depending on the type of uplink you have:

- DS3



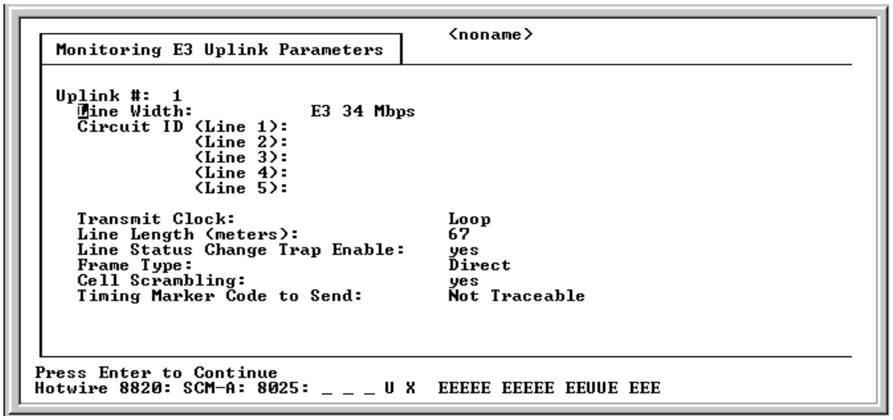
```
                                         <noname>
 Monitoring DS3 Uplink Parameters

 Uplink #:  1
   Line Width:            DS3 45 Mbps
   Circuit ID (Line 1):
              (Line 2):
              (Line 3):
              (Line 4):
              (Line 5):

   Transmit Clock:                      Loop
   Line Length:                         65  feet (20  meters)
   Line Status Change Trap Enable:      no
   Frame Type:                          PLCP
   C Bit Parity Ignore:                 no
   Cell Scrambling:                     yes
   Far End Loopback Timer:              0

Press Enter to Continue█
Hotwire 8820: SCM-A: 8021: _ _ _ U X  UEIEI UUEEE EIEEE UEE
```

- OC3



```
                                         <noname>
 Monitoring OC3 Uplink Parameters

 Uplink #:  1
   Line Width:            OC3 155 Mbps
   Line Type:             MMF-2 Km
   Mode of Operation:     SONET STS-3c
   Circuit ID (Line 1):   Now is
              (Line 2):   the time
              (Line 3):   for all
              (Line 4):   good men
              (Line 5):   to come to the aid of their computers.
   Transmit Clock:        Loop
   Line Status Change
    Trap Enable:          yes
   Cell Scrambling:       yes

Press Enter to Continue█
Hotwire 8820: SCM-A: 8022: _ M _ D X  EEEEE EEEEE EEUEE EEE
```

- E3



```
 Monitoring E3 Uplink Parameters         <noname>

 Uplink #:  1
   Line Width:             E3 34 Mbps
   Circuit ID (Line 1):
              (Line 2):
              (Line 3):
              (Line 4):
              (Line 5):

   Transmit Clock:                       Loop
   Line Length (meters):                 67
   Line Status Change Trap Enable:       yes
   Frame Type:                           Direct
   Cell Scrambling:                      yes
   Timing Marker Code to Send:           Not Traceable


Press Enter to Continue
Hotwire 8820: SCM-A: 8025: _ _ _ U X  EEEEE EEEEE EEUUE EEE
```

The Monitoring Uplink Parameters screens display the information listed in Table 5-3, Monitoring Uplink Parameters Screens.

**Table 5-3. Monitoring Uplink Parameters Screens (1 of 2)**

| Monitoring DS3 Uplink Parameters | B-B-A |
|---|---|
| **Uplink #** – Displays 1. | |
| **Line Width** – Displays DS3 45 Mbps. | |
| **Circuit ID** – Identifies the circuit/link/line (if one has been entered on screen **A-B-A**). | |
| **Transmit Clock** – Loop/Local. Displays the DS3 link's transmit side clocking. | |
| **Line Length** – Cable line length in feet (0–900). | |
| **Line Status Change Trap Enable** – Yes/No. Yes indicates that change-of-state SNMP traps are sent to the NMS. | |
| **Frame Type** – Direct/PLCP. The type of cell mapping that will be used to map ATM cells into the DS3 C-Bit Parity format. | |
| **C-Bit Parity Ignore** – Yes/No. If yes, C-bit parity errors will not be registered. | |
| **Cell Scrambling** – Yes/No. If yes, payload cell data is scrambled. | |
| **Far End Loopback Timer** – 0, 2, 15, 30, or 60 minutes. This timer is used to limit the duration of any line loopback initiated from a DS3 command received from the far end. If 0, then far-end commands will not be supported. | |

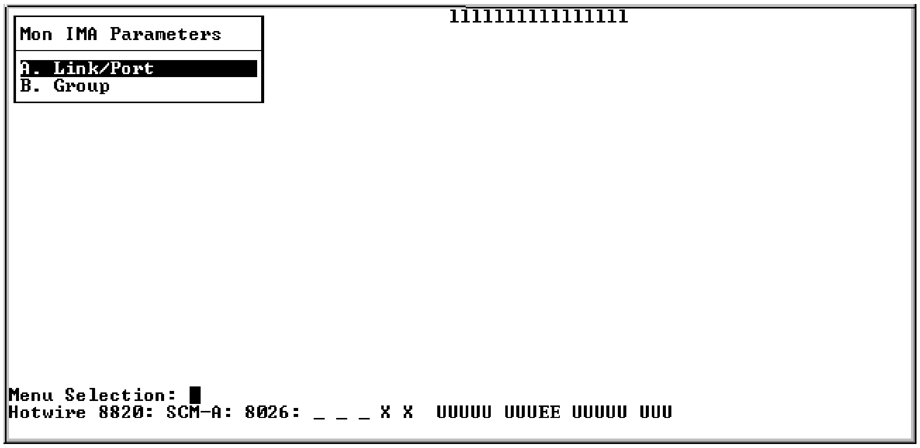
**Table 5-3. Monitoring Uplink Parameters Screens (2 of 2)**

| **Monitoring OC3 Uplink Parameters** | **B-B-A** |
|---|---|
| **Uplink #** – Displays 1.<br>**Line Width** – Displays OC3 155 Mbps.<br>**Line Type** – MMF (2 Km)/SMF (15 Km)/SMF (40 Km). Displays the type of interface supported by the link.<br>**Mode of Operation** – SONET STS-3c/SDH STM-1 (Default = SONET STS-3c).<br>**Circuit ID** – Identifies the circuit/link/line (if one has been entered on screen **A-B-A**).<br>**Transmit Clock** – Loop/Local. Displays the OC3 link's transmit side clocking.<br>**Line Status Change Trap Enable** – Yes/No (Default = yes). Yes indicates that change-of-state SNMP traps are sent to the NMS.<br>**Cell Scrambling** – Yes/No (Default = yes). If yes, payload cell data is scrambled. | |
| **Monitoring E3 Uplink Parameters** | **B-B-A** |
| **Uplink #** – Displays 1.<br>**Line Width** – Displays E3 34 Mbps.<br>**Circuit ID** – Identifies the circuit/link/line (if one has been entered on screen **A-B-A**).<br>**Transmit Clock** – Loop/Local. Displays the E3 link's transmit side clocking.<br>**Line Length** – Cable line length in meters (0–300).<br>**Line Status Change Trap Enable** – Yes/No (Default = yes). Yes indicates that change-of-state SNMP traps are sent to the NMS.<br>**Frame Type** – PLCP/Direct (Default = Direct). Identifies how ATM cells are mapped into the E3 format.<br>**Cell Scrambling** – Yes/No (Default = yes). If yes, payload cell data is scrambled.<br>**Timing Marker Code To Send** – Traceable/Not Traceable (Default = Not Traceable). Determines whether a timing source is traceable to a primary reference source. This field is not supported when Frame Type is set to PLCP. | |

## Displaying IMA Uplink Parameters

To display the parameters that define the operation of the IMA uplink (link/port and IMA group), follow this menu selection sequence:

*Monitoring→Physical Ports→Uplink Parameters* (**B-B-A**)



```
1111111111111111
Menu Selection: █
Hotwire 8820: SCM-A: 8026: _ _ _ X X  UUUUU UUUEE UUUUU UUU
```

The Mon IMA Parameters menu provides the following options:

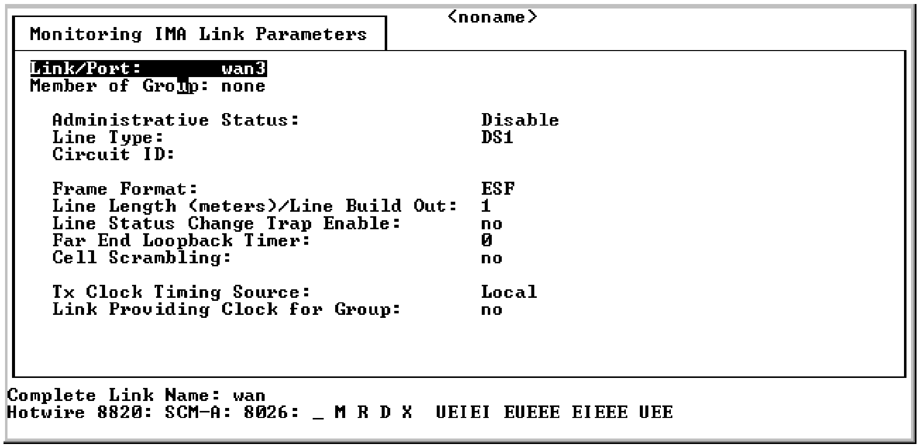
- **A. Link/Port** – The IMA uplink displays the parameters configured on a per port basis on the IMA Group Membership Configuration screen (**A-B-A-B**) and IMA Group Timing Configuration screen (**A-B-A-C**).
- **B. Group** – Displays the parameters configured on the IMA Group Timing Configuration screen (**A-B-A-C**) and Configuration IMA Group Parameters screen (**A-B-A-D**).

## Displaying IMA Link/Port Parameters

To display the parameters associated with the IMA uplink, follow this menu selection sequence:

*Monitoring*→*Physical Ports* →*Uplink Parameters* →*Link/Port* (**B-B-A-A**)

The Monitoring IMA Link Parameters screen appears.



```
 Monitoring IMA Link Parameters          <noname>

 Link/Port:        wan3
 Member of Group: none

   Administrative Status:                Disable
   Line Type:                            DS1
   Circuit ID:

   Frame Format:                         ESF
   Line Length (meters)/Line Build Out:  1
   Line Status Change Trap Enable:       no
   Far End Loopback Timer:               0
   Cell Scrambling:                      no

   Tx Clock Timing Source:               Local
   Link Providing Clock for Group:       no

Complete Link Name: wan
Hotwire 8820: SCM-A: 8026: _ M R D X  UEIEI EUEEE EIEEE UEE
```

The Monitoring IMA Link Parameters screen displays the information listed in Table 5-4, Monitoring IMA Link Parameters Screen.

**Table 5-4. Monitoring IMA Link Parameters Screen**

**Monitor IMA Link Parameters** **B-B-A-A**

**Link/Port** – Enter the physical link/port to display.

**Member of Group** – Group Membership as configured on the IMA Group Membership Configuration screen (**A-B-A-B**).

**Administrative Status** – Displays whether the physical link is enabled or disabled.

**Line Type** – Type of IMA uplink, as determined by model number:

- DS1 = Model 8026
- E1 75 ohm = Model 8027
- E1 120 ohm = Model 8028

**Circuit ID** – DIsplays the identify of the circuit/link/line.

**Frame Format** – Frame format for the link.

**Line Length (feet)/Line Build Out** – The line length or line build out value (depending on IMA uplink and line type).

**Line Status Change Trap Enable** – Yes indicates that change-of-state SNMP traps are sent to the NMS.

**Far End Loopback Timer** – Configured timer setting in minutes.

**Cell Scrambling** – Displays whether or not cell scrambling is in effect.

**Tx Clock Timing Source** – Link Tx Clock Timing setting configured on the IMA Group Timing Configuration screen (**A-B-A-C**).

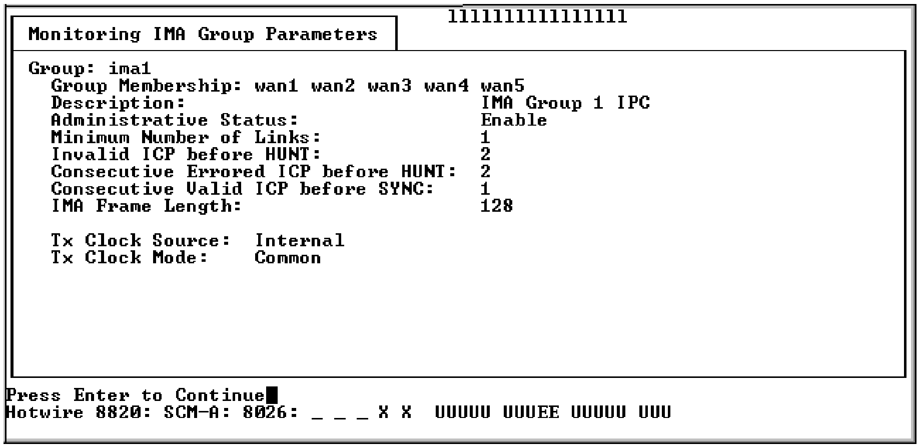
**Link Providing Clock for Group** – Link Providing Clock setting configured on the IMA Group Timing Configuration screen (**A-B-A-C**).

## Displaying IMA Group Information

To display the information associated with IMA groups, follow this menu selection sequence:

*Monitoring→Physical Ports→Uplink Parameters →Group* (**B-B-A-B**)

The Monitoring IMA Group Parameters screen appears.



```
 Monitoring IMA Group Parameters           1111111111111111

 Group: ima1
   Group Membership: wan1 wan2 wan3 wan4 wan5
   Description:                            IMA Group 1 IPC
   Administrative Status:                  Enable
   Minimum Number of Links:                1
   Invalid ICP before HUNT:                2
   Consecutive Errored ICP before HUNT:    2
   Consecutive Valid ICP before SYNC:      1
   IMA Frame Length:                       128

   Tx Clock Source:  Internal
   Tx Clock Mode:    Common

Press Enter to Continue█
Hotwire 8820: SCM-A: 8026: _ _ _ X X  UUUUU UUUEE UUUUU UUU
```

The Monitoring IMA Group Parameters screen displays the information listed in Table 5-5, Monitoring IMA Group Parameters Screen.

**Table 5-5. Monitoring IMA Group Parameters Screen**

| Monitoring IMA Group Parameters | B-B-A-B |
|---|---|

NOTE: Group configuration information determined during IMA start-up is displayed on the Uplink Status screen (**B-B-C**).

**Group** – Displays ima1.

**Group Membership** – A list of current members of the group.

**Description** – A descriptive identifier.

**Administrative Status** – Displays whether the IMA group is enabled or disabled.

**Minimum Number of Links** – The minimum acceptable number of active links/ports for the IMA group to become operational.

**Invalid ICP before HUNT** – The number of invalid ICP cells allowed before going from the SYNC state to the HUNT state.

**Consecutive Errored ICP before HUNT** – The number of consecutive errored ICP cells allowed before going from the SYNC state to the HUNT state.

**Consecutive Valid ICP before SYNC** – The number of consecutive valid ICP cells required before going from the PRESYNC state to the SYNC state.

**IMA Frame Length** – The frame length used by the near-end IMA group.

NOTE: IPC Release 4.1.3GA only supports a frame size of 128.

**Tx Clock Source** – The currently configured Tx Clock Source (**A-B-A-C**).

**Link Providing Clock** – This field displays only if you chose the interface selection for Group Tx Clock Source (**A-B-A-C**). Displays the wan link selected to provide timing to the group clock.

**Tx Clock Mode** – The currently configured Tx Clock Mode (**A-B-A-C**).

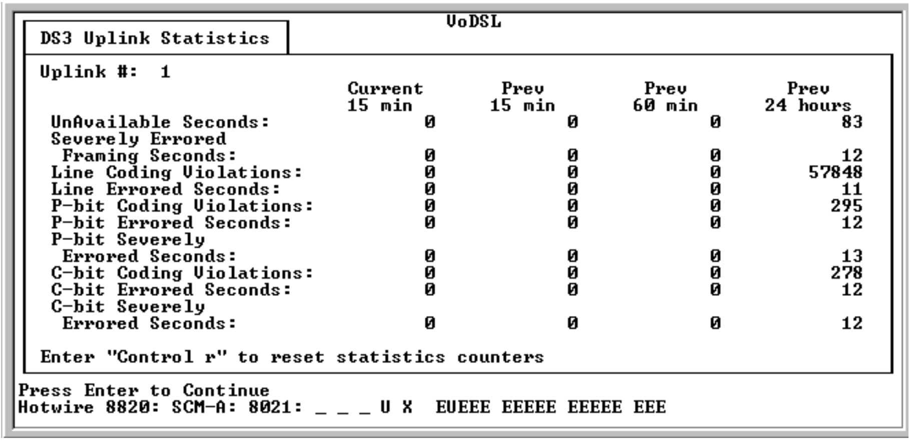
## Displaying Uplink Statistics

To display the uplink statistics (either DS3, OC3, or E3), follow this menu selection sequence:

*Monitoring→Physical Ports→Uplink Stats* (**B-B-B**)

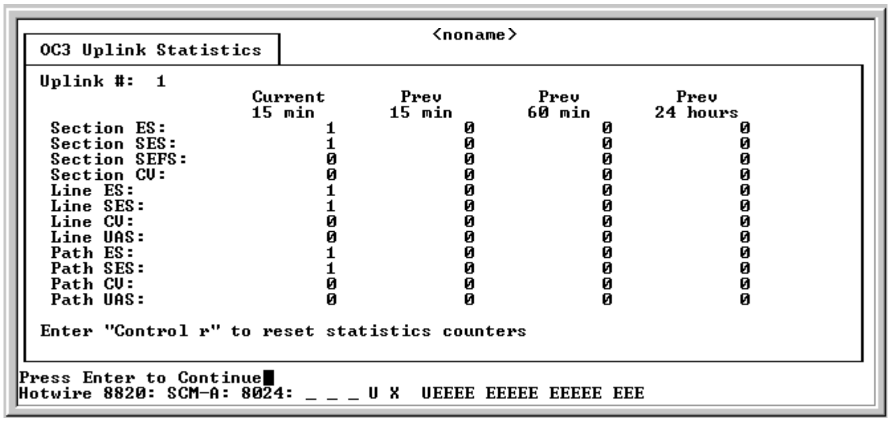
The Monitoring Uplink Statistics screen appears. This screen differs depending on the type of uplink you have and for DS3 and E3, the framing mode (Direct or PLCP):

- DS3 – PLCP Mode



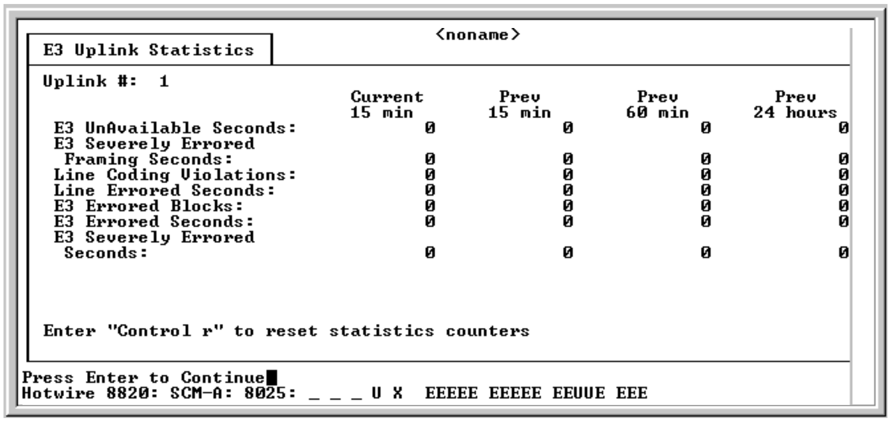
```
                                       VoDSL
 DS3 Uplink Statistics

 Uplink #:  1
                              Current      Prev         Prev        Prev
                              15 min       15 min       60 min      24 hours
  UnAvailable Seconds:              0            0            0           83
  Severely Errored
   Framing Seconds:                 0            0            0           12
  Line Coding Violations:           0            0            0        57848
  Line Errored Seconds:             0            0            0           11
  P-bit Coding Violations:          0            0            0          295
  P-bit Errored Seconds:            0            0            0           12
  P-bit Severely
   Errored Seconds:                 0            0            0           13
  C-bit Coding Violations:          0            0            0          278
  C-bit Errored Seconds:            0            0            0           12
  C-bit Severely
   Errored Seconds:                 0            0            0           12

 Enter "Control r" to reset statistics counters

Press Enter to Continue
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

- OC3



```
                                      <noname>
 OC3 Uplink Statistics

 Uplink #:  1
                     Current      Prev        Prev        Prev
                     15 min       15 min      60 min      24 hours
  Section ES:              1           0           0           0
  Section SES:             1           0           0           0
  Section SEFS:            0           0           0           0
  Section CV:              0           0           0           0
  Line ES:                 1           0           0           0
  Line SES:                1           0           0           0
  Line CV:                 0           0           0           0
  Line UAS:                0           0           0           0
  Path ES:                 1           0           0           0
  Path SES:                1           0           0           0
  Path CV:                 0           0           0           0
  Path UAS:                0           0           0           0

 Enter "Control r" to reset statistics counters

Press Enter to Continue█
Hotwire 8820: SCM-A: 8024: _ _ _ U X  UEEEE EEEEE EEEEE EEE
```

- E3 – Direct Mode



```
                                       <noname>
  E3 Uplink Statistics
  Uplink #:  1
                               Current       Prev         Prev         Prev
                               15 min       15 min       60 min     24 hours
   E3 UnAvailable Seconds:            0            0            0            0
   E3 Severely Errored
    Framing Seconds:                  0            0            0            0
   Line Coding Violations:            0            0            0            0
   Line Errored Seconds:              0            0            0            0
   E3 Errored Blocks:                 0            0            0            0
   E3 Errored Seconds:                0            0            0            0
   E3 Severely Errored
    Seconds:                          0            0            0            0



  Enter "Control r" to reset statistics counters

Press Enter to Continue
Hotwire 8820: SCM-A: 8025: _ _ _ U X  EEEEE EEEEE EEUUE EEE
```

## NOTES:

— All counters are updated every 15 minutes and each time the screen is refreshed. You may press Ctrl-r at any time to reset the User interface and SNMP interface statistical counters.

— Statistics are kept for the present 15-minute period, previous 15-minute period, previous 60-minute period, and the previous 24-hour period (counters are reset at midnight). All counters are synchronized to the MCP card's real-time clock.

The Monitoring Uplink Stats screens display the information listed in Table 5-6, Monitoring Uplink Statistics Screens.

**Table 5-6. Monitoring Uplink Statistics Screens (1 of 3)**

| DS3 Uplink Statistics B-B-B |
|---|
| **Uplink #** – Displays 1.<br>**UnAvailable Seconds** – Second interval for which the path is unavailable if it has received any of the following events for 10 contiguous seconds:<br>■ Greater than 44 C-Bit Coding Violations (CCVs)<br>■ One or more Out of Frame seconds<br>■ An AIS signal<br>**Severely Errored Framing Seconds** – A second with one or more OOF defects or the detection of an incoming AIS signal.<br>**Line Coding Violations** – Number of Line Code Violations (LCVs) detected (Bipolar Violation or Excessive Zeros).<br>**Line Errored Seconds** – Any second with one or more LCVs or incoming defects such as PCVs (P-Bit Coding Violation), CCVs (C-Bit Coding Violation), or LOS (Loss of Signal) defects. The P-bit monitors line (not path) parity. The C-bit monitors path (not line) parity.<br>**P-bit Coding Violations** – The number of PCVs detected.<br>**P-bit Errored Seconds** – A second with one or more PCVs or OOF defects, or an AIS signal is being received.<br>**P-bit Severely Errored Seconds** – A second with 44 or more PCVs, or one or more OOF defects or an AIS signal is being received.<br>**C-bit Coding Violations** – Displays the number of CCVs that have been detected.<br>**C-bit Errored Seconds** – A second with one or more CCVs or OOF defects, or an AIS signal is being received.<br>**C-bit Severely Errored Seconds** – A second with 44 or more CCVs, or one or more OOF defects or an AIS signal is being received. |

**Table 5-6. Monitoring Uplink Statistics Screens (2 of 3)**

**OC3 Uplink Statistics** **B-B-B**

**Uplink #** – Displays 1.

**Section ES** – Errored Seconds. The count of seconds with one or more Section layer parity errors (Bit B1) or incoming defects such as SEF (Severely Errored Frame), LOS (Loss of Signal), AIS (Alarm Indication Signal) or LOP (Loss of Pointer).

**Section SES** – Severely Errored Seconds. The count of seconds with more than a specified number of Section layer parity errors (Bit B1) or incoming defects such as SEF or LOS.

**Section SEFS** – Severely Errored Framing Seconds. The count of seconds with one or more OOF (Out of Frame) defects.

**Section CVs** – Coding Violations. The count of CVs (Section Parity Error, Bit B1) that have been detected in the time period.

**Line ES** – Errored Seconds. The count of seconds with one or more Line layer parity errors (Bit B2) or incoming defects such as SEF, LOS, or AIS.

**Line SES** – Severely Errored Seconds. The count of seconds with more than a specified number of Line layer parity errors (Bit B2) or incoming defects such as SEF, LOS, or AIS.

**Line CV** – Coding Violations. The count of CVs (Line Parity Error, Bit B2) that have been detected in the time period.

**Line UAS** – Unavailable Seconds. The count of UASs that have been detected in the time period. A line is determined to be unavailable if it receives 10 contiguous SESs. After 10 seconds with no SESs, the line becomes available again.

**Path ES** – Errored Seconds. The count of seconds with one or more Path layer parity errors (Bit B3) or incoming defects such as SEF (Severely Errored Frame), LOS (Los of Signal), AIS, or LOP (Loss of Pointer).

**Path SES** – Severely Errored Seconds. The count of seconds with more than a specified number of Path layer parity errors (Bit B3) or incoming defects such as SEF, LOS, AIS, or LOP.

**Path CV** – Coding Violations. The count of CVs (Line Parity Error, Bit B3) that have been detected in the time period.

**Path UAS** – Unavailable Seconds. The count of UASs that have been detected in the time period. A path is determined to be unavailable if it receives 10 contiguous SESs. After 10 seconds with no SESs, the path becomes available again.

**E3 Uplink Statistics (Direct Mode)** **B-B-B**

**Uplink #** – Displays 1.

**E3 UnAvailable Seconds** – Second interval for which the E3 path is unavailable.

**E3 Severely Errored Framing Seconds** – A second with one or more E3 OOF defects or the detection of an incoming AIS signal.

**Line Coding Violations** – Number of Line Code Violations (LCVs) detected (Bipolar Violation or Excessive Zeros).

**Line Errored Seconds** – Any second with one or more LCVs or LOS defects.

**E3 Errored Blocks** – The number of E3 errored blocks detected (blocks with one or more bits in error).

**E3 Errored Seconds** – A second with one or more E3 BIP-8 errors being received.

**E3 Severely Errored Seconds** – A second with 2400 or more E3 BIP-8 errors being received.

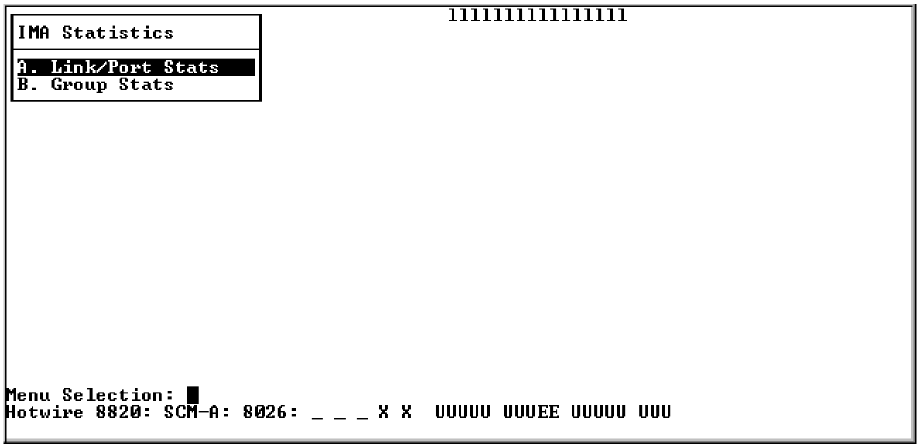
**Table 5-6. Monitoring Uplink Statistics Screens (3 of 3)**

| **E3 Uplink Statistics (PLCP Mode)** **B-B-B** |
|---|
| **Uplink #** – Displays 1. |
| **PLCP UnAvailable Seconds** – Second interval for which the PLCP path is unavailable. |
| **E3 Severely Errored Framing Seconds** – A second with one or more E3 OOF defects or the detection of an incoming AIS signal. |
| **PLCP Severely Errored Framing Seconds** – A second with one or more PLCP OOF defects. |
| **Line Coding Violations** – Number of Line Code Violations (LCVs) detected (Bipolar Violation or Excessive Zeros). |
| **Line Errored Seconds** – Any second with one or more LCVs or LOS defects. |
| **PLCP Errored Blocks** – The number of PLCP errored blocks detected (blocks with one or more bits in error). |
| **PLCP Errored Seconds** – A second with one or more PLCP BIP-8 errors being received. |
| **PLCP Severely Errored Seconds** – A second with 2419 or more PLCP BIP-8 errors being received. |

## Displaying IMA Uplink Statistics

To display the IMA Statistics menu, follow this menu selection sequence:

*Monitoring→Physical Ports→Uplink Stats* (**B-B-B**)



```
IMA Statistics                                 1111111111111111

A. Link/Port Stats
B. Group Stats

Menu Selection: █
Hotwire 8820: SCM-A: 8026: _ _ _ X X  UUUUU UUUEE UUUUU UUU
```

The IMA Statistics menu provides the following options:

- **A. Link/Port Stats** – The IMA uplink displays physical statistics for the selected link/port.
- **B. Group Stats** – Displays the IMA group statistics.

### NOTES:

— All counters are updated every 15 minutes and each time the screen is refreshed. You may press Ctrl-r at any time to reset the User interface and SNMP interface statistical counters.

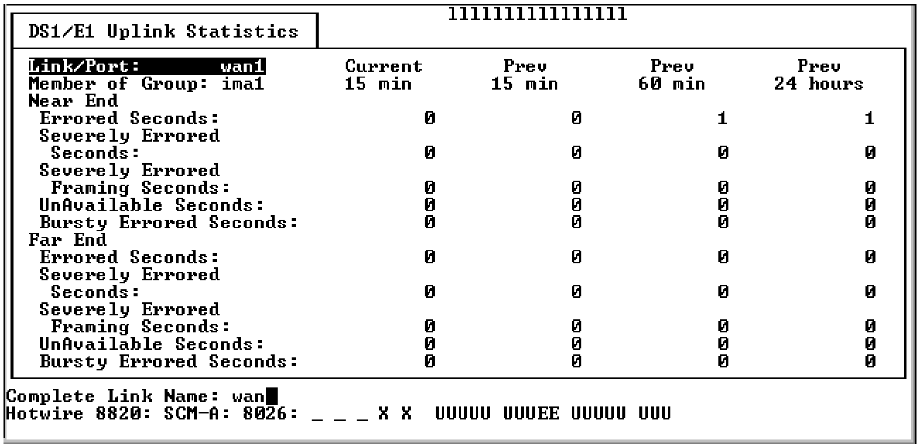
— Statistics are kept for the present 15-minute period, previous 15-minute period, previous 60-minute period, and the previous 24-hour period (counters are reset at midnight). All counters are synchronized to the MCP card’s real-time clock.

## Displaying IMA Link/Port Statistics

To display the physical link/port statistics for the IMA uplink, follow this menu selection sequence:

*Monitoring→Physical Ports→Uplink Stats →Link/Port Stats* (**B-B-B-A**)

The DS1/E1 Uplink Statistics screen appears.



```
                                     1111111111111111
 DS1/E1 Uplink Statistics

 Link/Port:         wan1        Current      Prev        Prev        Prev
 Member of Group: ima1          15 min      15 min      60 min      24 hours
 Near End
  Errored Seconds:                   0           0           1           1
  Severely Errored
   Seconds:                          0           0           0           0
  Severely Errored
   Framing Seconds:                  0           0           0           0
  UnAvailable Seconds:               0           0           0           0
  Bursty Errored Seconds:            0           0           0           0
 Far End
  Errored Seconds:                   0           0           0           0
  Severely Errored
   Seconds:                          0           0           0           0
  Severely Errored
   Framing Seconds:                  0           0           0           0
  UnAvailable Seconds:               0           0           0           0
  Bursty Errored Seconds:            0           0           0           0

Complete Link Name: wan█
Hotwire 8820: SCM-A: 8026: _ _ _ X X  UUUUU UUUEE UUUUU UUU
```

The DS1/E1 Uplink Statistics screen displays the information listed in Table 5-7, DS1/E1 Uplink Statistics Screen.

**Table 5-7. DS1/E1 Uplink Statistics Screen**

| DS1/E1 Uplink Statistics | B-B-B-A |
|---|---|

Statistics are displayed for both the near end and far end for links that are currently enabled.

NOTE: All far-end fields are displayed only for DS1/ESF links.

**Link/Port** – Enter the physical link/port to display.

**Member of Group** – Displays ima1 or none.

**Errored Seconds** – For DS1/ESF and E1/CRC-4 links, a second with one or more Path Code Violations (PCVs), Out of Frame (OOF) defects, or Controlled Slip events. For E1 non-CRC events, a second with a Bipolar Violation (BPV). This count is not incremented during an unavailable second.

**Severely Errored Seconds** – For DS1/ESF signals, a second with 320 or more PCVs, or one or more OOF defects, or the detection of an incoming AIS signal. For E1/CRC-4 signals, a second with 832 or more PCVs, or one or more OOFs. For E1/non-CRC signals, a second with 2048 Line Code Violations (LCVs). Controlled slips are not included in this count. This count is not incremented during an unavailable second.

**Severely Errored Framing Seconds** – A second with one or more OOF defects or the detection of an incoming AIS signal.

**UnAvailable Seconds** – Second interval for which the physical interface is unavailable.

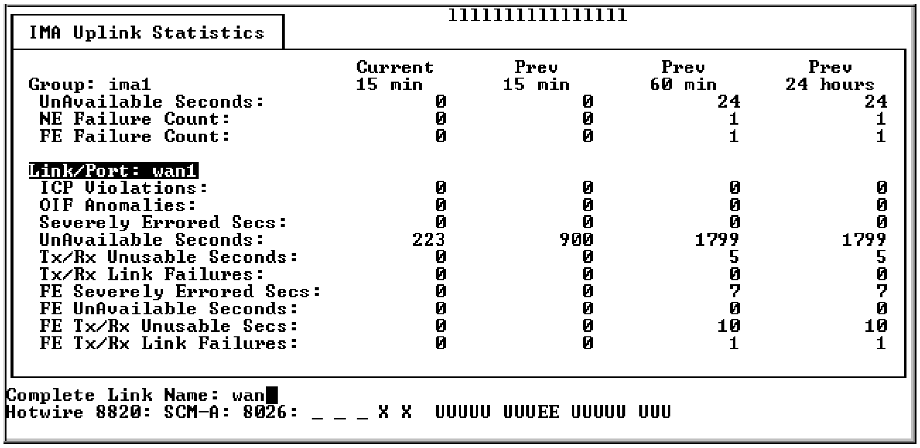
**Bursty Errored Seconds** – For DS1/ESF signals only. A second with fewer than 320 and more than one PCVs, no Severely Errored Frame defects, and no detected incoming AIS signals. Controlled slips are not included in this count. This count is not incremented during an unavailable second.

## Displaying IMA Group Statistics

To display statistics for the IMA group, follow this menu selection sequence:

*Monitoring→Physical Ports→ Uplink Stats → Group Stats* (**B-B-B-B**)

The IMA Uplink Statistics screen appears.



```
                                       1111111111111111
  IMA Uplink Statistics

                               Current       Prev         Prev         Prev
  Group: ima1                  15 min       15 min       60 min      24 hours
   UnAvailable Seconds:               0            0           24           24
   NE Failure Count:                  0            0            1            1
   FE Failure Count:                  0            0            1            1

  Link/Port: wan1
   ICP Violations:                    0            0            0            0
   OIF Anomalies:                     0            0            0            0
   Severely Errored Secs:             0            0            0            0
   UnAvailable Seconds:             223          900         1799         1799
   Tx/Rx Unusable Seconds:            0            0            5            5
   Tx/Rx Link Failures:               0            0            0            0
   FE Severely Errored Secs:          0            0            7            7
   FE UnAvailable Seconds:            0            0            0            0
   FE Tx/Rx Unusable Secs:            0            0           10           10
   FE Tx/Rx Link Failures:            0            0            1            1

Complete Link Name: wan█
Hotwire 8820: SCM-A: 8026: _ _ _ X X  UUUUU UUUEE UUUUU UUU
```

The IMA Uplink Statistics screen displays the information listed in Table 5-8, IMA Uplink Statistics Screen.

**Table 5-8. IMA Uplink Statistics Screen**

| IMA Uplink Statistics | B-B-B-B |
|---|---|

Statistics are displayed for both the near end and far end for links that are currently enabled. A link must be configured as a member of the IMA group for it to contribute to IMA Group/Link statistics.

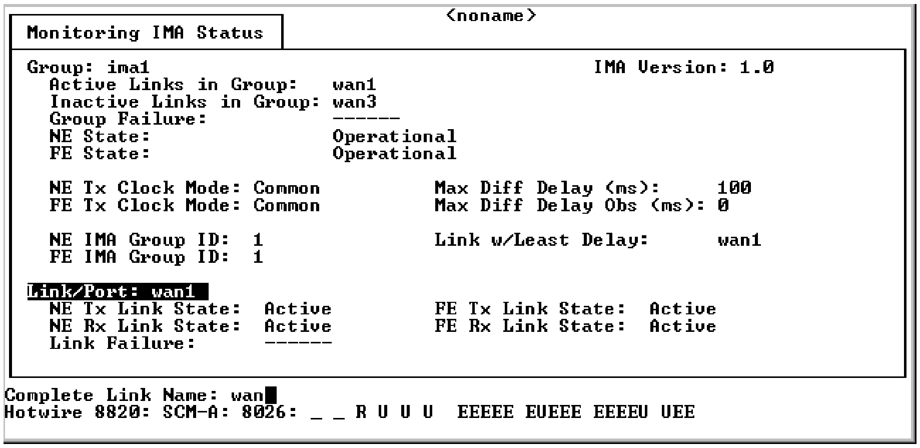
- **Group** – Displays ima1.
  - **UnAvailable Seconds** – Second interval for which the IMA group is down (UAS).
  - **NE Failure Count** – The number of times a near-end group failure has been reported since power-on or reboot.
  - **FE Failure Count** – Number of times a far-end group failure has been reported since power-on or reboot.
- **Link/Port** – Enter the physical link/port to display. The default is the last selection entered. You may choose from both inside and outside the IMA group.
  - **ICP Violations** – A count of ICP cell violations (errored, invalid or missing), except during seconds when an SES or UAS condition is reported.
  - **OIF Anomalies** – Number of Out of IMA Frame (OIF) anomalies.
  - **Severely Errored Secs** – Number of one-second intervals containing 30% or greater of the ICP cells counted as ICP violations or more than one link defect (LOS, OOF/LOF, AIS, or LCD), LIF, or LODS defects, except during NE UAS conditions.
  - **Unavailable Seconds** – Number of one-second intervals that the near-end is unavailable.
  - **Tx/Rx Unusable Seconds** – Sum of TX unusable seconds and RX unusable seconds for the near end.
  - **Tx/Rx Link Failures** – Count of TX and RX link failures for the near end.
  - **FE Severely Errored Secs** – Number of one-second intervals containing one or more remote defects, except during NE UAS conditions.
  - **FE UnAvailable Seconds** – Number of one-second intervals that the far end is unavailable.
  - **FE Tx/Rx Unusable Secs** – Sum of TX unusable seconds and RX unusable seconds for the far end.
  - **FE Tx/Rx Link Failures** – Sum of TX unusable seconds and RX unusable seconds for the far end.

## Displaying IMA Group Status

To display the IMA group status, follow this menu selection sequence:

*Monitoring→Physical Ports→Uplink Status* (**B-B-C**)

The Monitoring IMA Status screen appears.



```
                                   <noname>
 Monitoring IMA Status
 Group: ima1                                         IMA Version: 1.0
   Active Links in Group:   wan1
   Inactive Links in Group: wan3
   Group Failure:           ------
   NE State:                Operational
   FE State:                Operational

   NE Tx Clock Mode: Common           Max Diff Delay (ms):     100
   FE Tx Clock Mode: Common           Max Diff Delay Obs (ms): 0

   NE IMA Group ID:  1                Link w/Least Delay:      wan1
   FE IMA Group ID:  1

 Link/Port: wan1
   NE Tx Link State:  Active          FE Tx Link State:  Active
   NE Rx Link State:  Active          FE Rx Link State:  Active
   Link Failure:      ------

Complete Link Name: wan
Hotwire 8820: SCM-A: 8026: _ _ R U U U  EEEEE EUEEE EEEEU UEE
```

The Monitoring IMA Status screen displays the information listed in Table 5-9, Monitoring IMA Status Screen.

**Table 5-9. Monitoring IMA Status Screen**

**Monitoring IMA Status** **B-B-C**

**Group** – Displays ima1.

**IMA Version** – Displays the IMA OAM label value transmitted by the near-end IMA. Displays 1.1 unless the far-end IMA only supports Version 1.0, in which case 1.0 is displayed.

**Active Links in Group** – A list of the wan links that are both administratively enabled and are active in the IMA group.

**Group Failure** – The current group failure status for near end (NE) or far end (FE), including Start-up, Invalid M Value, Insufficient Links, Blocked, Other, and Invalid IMA Version. Displays ------- if no current failure is detected.

**NE/FE State** – The group state, including Operational, Start Up, Start Up ACK, Not Configured, Config Abort Incompatible Symmetry, Config Abort Unsupported IMA Version, Config Abort Other, Insufficient Links, and Blocked.

**NE/FE Tx Clock Mode** – Common/Independent. The transmit clocking mode set on the IMA Group Timing Configuration screen (**A-B-A-C**).

**Max Diff Delay (ms)** – Displays 100 ms, the maximum tolerated differential delay among links in the group.

**Max Diff Delay Obs (ms)** – The maximum differential delay observed among links in the group (Maximum = 999 ms).

**NE/FE IMA Group ID** – The IMA ID for near end (NE) and far end (FE).

**Link w/Least Delay** – The wan link with the least observed delay. Displays ------- if the link with the least delay cannot be determined.

**Link/Port** – Enter the physical link/port to display. Choose from links currently in the IMA group (press Ctrl-v for a list).

**Link State** – Displays the near end and far end transmit and receive link states for the selected link (Ne Tx, Ne Rx, Fe Tx, Fe Rx):

- Not In Group = Link is not configured within the IMA group.
- Active = Link is capable of passing ATM layer cells to/from the ATM layer.
- Usable = Link is ready to operate, but is waiting for the other end to be Usable or Active.
- Unusable = Link is configured, but not in use.

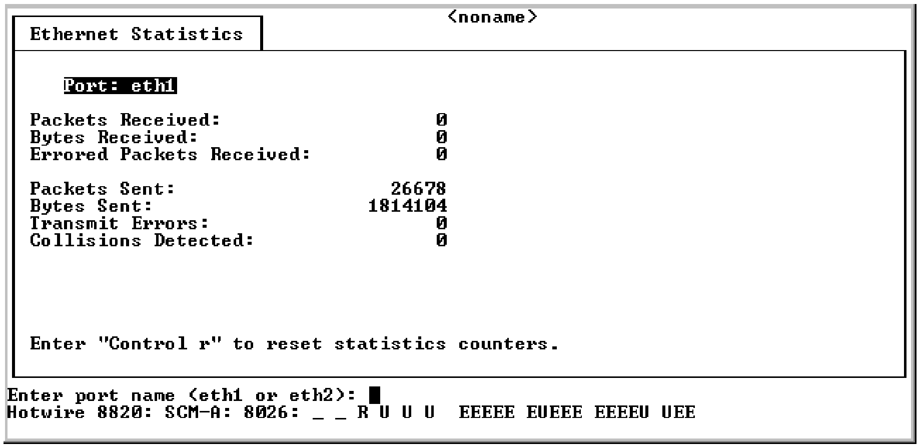
**Link Failure** – The current link failure status for the wan, including IMA Link Failure (LOS, LOF, AIS, LCD), Loss of IMA Frame (LIF), Link Out of Delay Synchronization (LODS), Misconnected, Blocked, FE Transmit Link Unusable, and FE Receive Link Unusable, or ----- (none).

## Displaying Ethernet Statistics

To display statistics for either the internal (Eth1) or external (Eth2) Ethernet interface, follow this menu selection sequence:

*Monitoring→Physical Ports→Ethernet Stats* (**B-B-D**)

The Ethernet Statistics screen appears.



```
 Ethernet Statistics                   <noname>

    Port: eth1

 Packets Received:                    0
 Bytes Received:                      0
 Errored Packets Received:            0

 Packets Sent:                    26678
 Bytes Sent:                    1814104
 Transmit Errors:                     0
 Collisions Detected:                 0



 Enter "Control r" to reset statistics counters.

Enter port name (eth1 or eth2): █
Hotwire 8820: SCM-A: 8026: _ _ R U U U  EEEEE EUEEE EEEEU UEE
```

### NOTES:

- — All counters are updated every time the screen is refreshed. You may press Ctrl-r at any time to reset all statistics to zero.
- — All counters are 32-bit wrap counters and wrap to zero once the maximum is reached.

The Ethernet Statistics screen displays the information listed in Table 5-10, Ethernet Statistics Screen.

**Table 5-10. Ethernet Statistics Screen**

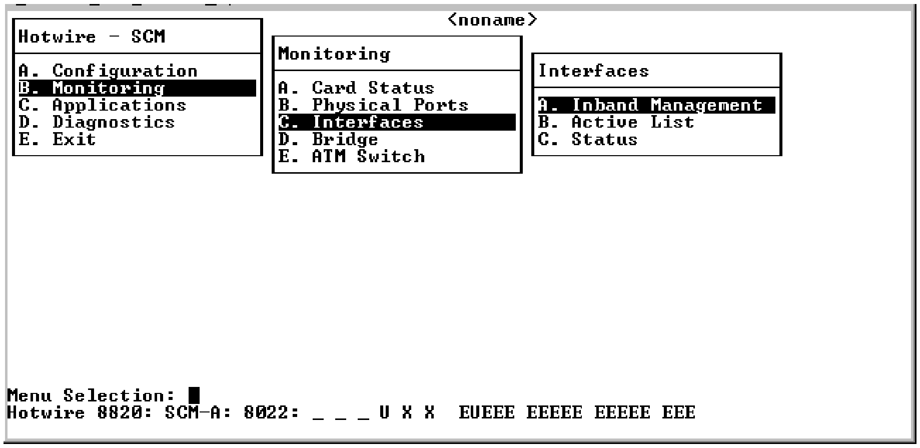
| **Ethernet Statistics** | **B-B-D** |
|---|---|
| Statistics are displayed for the desired Ethernet interface port. Each counter is 32 bits and wraps to zero when the maximum value is reached. Statistics for the Ethernet port are also available from the Ethernet Statistics screen on the SCM card (**B-C-A-B**) and for the internal Ethernet port (eth1) on the MCP card (**B-B-D**).<br>**Port** – eth1/eth2. Enter the Ethernet port for which you want to display statistics (eth1 for internal or eth2 for external).<br>**Packets Received** – Number of packets received on the channel.<br>**Bytes Received** – Number of bytes received on the channel.<br>**Errored Packets Received** – Number of errored packets received from the selected Ethernet connection.<br>**Packets Sent** – Number of packets sent over the channel.<br>**Bytes Sent** – Number of bytes sent over the channel.<br>**Transmit Errors** – The number of transmit errors detected.<br>**Collisions Detected** – The number of collisions detected. | |

.

# Displaying Interfaces Menu Option

To access the Interfaces menu, follow this menu selection sequence:

*SCM Main Menu*→*Monitoring*→*Interfaces* (**B-C**)



```
                                        <noname>
 Hotwire - SCM
                       Monitoring
 A. Configuration                              Interfaces
 B. Monitoring         A. Card Status
 C. Applications       B. Physical Ports      A. Inband Management
 D. Diagnostics        C. Interfaces          B. Active List
 E. Exit               D. Bridge              C. Status
                       E. ATM Switch

Menu Selection: █
Hotwire 8820: SCM-A: 8022: _ _ _ U X X  EUEEE EEEEE EEEEE EEE
```

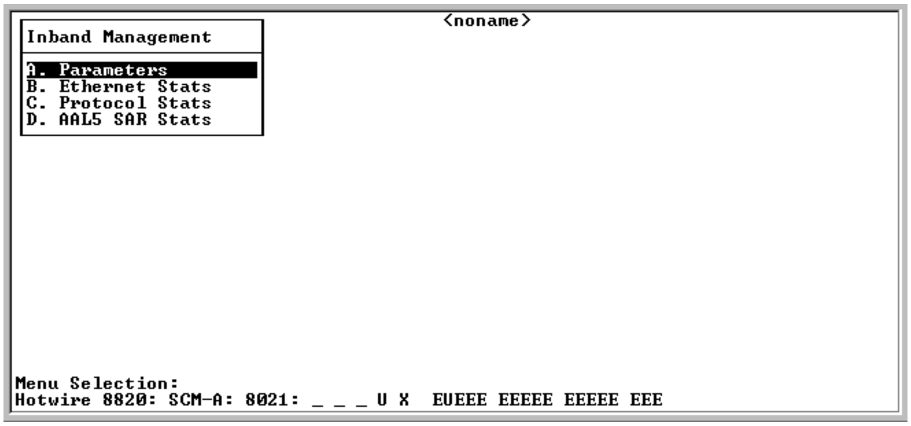
The Interfaces menu provides the following options:

- **A. Inband Management** – Displays the Inband Management Menu.
- **B. Active List** – Displays a list of active SCM interfaces.
- **C. Status** – Displays status for SCM interface(s).

## Displaying Inband Management Menu Options

Management data from the MCP card is sent to the SCM card via an internal Ethernet connection. At the SCM, the IP packets are converted to MPOA (RFC 1483), then to AAL5. The SAR function of the SCM card divides the IP packets into ATM cells. Statistics are provided at several points in the process, as indicated by the Inband Management menu.

*SCM Main Menu→Monitoring→Interfaces→Inband Management* (**B-C-A**)



```
                                        <noname>
 Inband Management

 A. Parameters
 B. Ethernet Stats
 C. Protocol Stats
 D. AAL5 SAR Stats






Menu Selection:
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The Inband Management menu provides the following options:

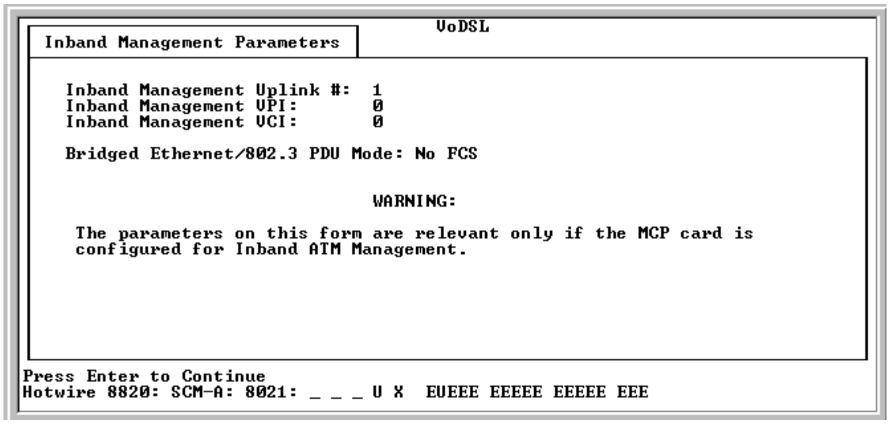
- **A. Parameters** – Displays parameters associated with the operation of the SCM uplink's Inband Management channel.
- **B. Ethernet Stats** – Displays statistics associated with the operation of Inband Management's Ethernet connection to the MCP card or to the external Ethernet connection.
- **C. AAL5. Protocol Stats** – Displays Multi-Protocol ATM statistics associated with the operation of Inband Management.
- **D. AAL5 SAR Stats** – Displays Inband Management SAR AAL5 statistics.

## Displaying Inband Management Parameters

To display the parameters associated with the operation of the SCM uplink's inband management channel, follow this menu selection sequence:

*Monitoring→Interfaces →Inband Management→Parameters* (**B-C-A-A**)

The Inband Management Parameters screen appears.



```
 Inband Management Parameters              VoDSL

   Inband Management Uplink #:  1
   Inband Management VPI:       0
   Inband Management VCI:       0

   Bridged Ethernet/802.3 PDU Mode: No FCS

                              WARNING:

    The parameters on this form are relevant only if the MCP card is
    configured for Inband ATM Management.

Press Enter to Continue
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The Inband Management Parameters screen displays the information listed in Table 5-11, Inband Management Parameters Screen.

**Table 5-11. Inband Management Parameters Screen**

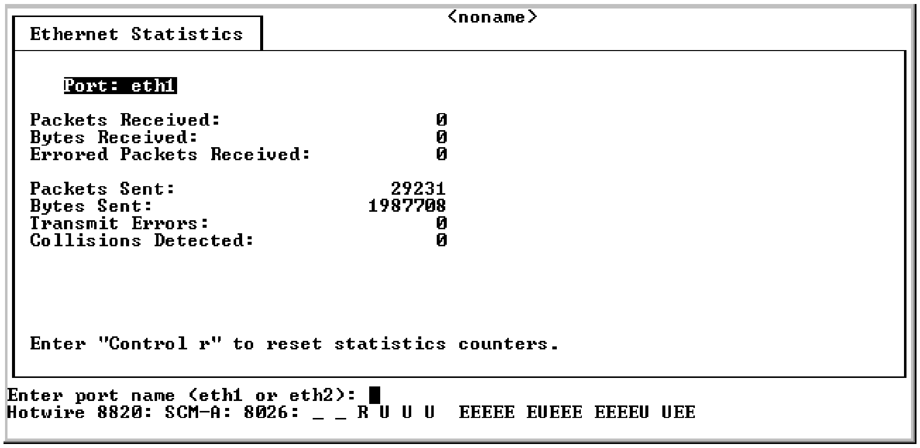
| **Inband Management**<br>**Inband Management Parameters** | **B-C-A-A** |
|---|---|
| **Inband Management Uplink #** – Displays 1. | |
| **Inband Management VPI** – The number of the uplink VPI (0–255) associated with the inband management channel. | |
| **Inband Management VCI** – The number of the uplink VCI (1–8191) associated with the inband management channel. | |
| **Bridged Ethernet /802.3 PDU Mode** – LAN FCS/No FCS. Displays whether the inband management Ethernet PDUs will contain a LAN FCS. | |

## Displaying Ethernet Statistics

To display Inband Management Ethernet statistics, follow this menu selection sequence:

*Monitoring→Interfaces →Inband Management→Ethernet Stats* (**B-C-A-B**)

The Ethernet Statistics screen appears.



```
 Ethernet Statistics               <noname>

   Port: eth1

 Packets Received:                   0
 Bytes Received:                     0
 Errored Packets Received:           0

 Packets Sent:                   29231
 Bytes Sent:                   1987708
 Transmit Errors:                    0
 Collisions Detected:                0




 Enter "Control r" to reset statistics counters.

Enter port name (eth1 or eth2): █
Hotwire 8820: SCM-A: 8026: _ _ R U U U  EEEEE EUEEE EEEEU UEE
```

### NOTES:

— All counters are updated every time the screen is refreshed. You may press Ctrl-r at any time to reset the User interface and SNMP interface statistical counters.

— All counters are 32-bit wrap counters and wrap to zero once the maximum is reached.

The Ethernet Statistics screen displays the information listed in Table 5-12, Ethernet Statistics Screen.

**Table 5-12. Ethernet Statistics Screen**

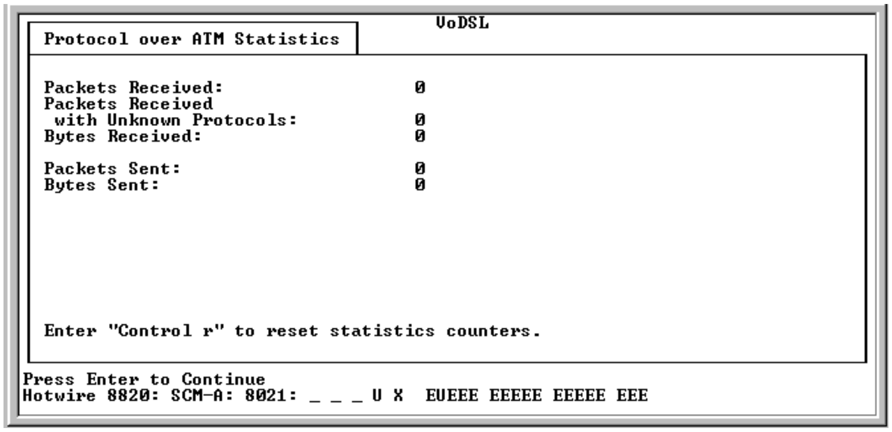
| **Inband Management**<br>**Ethernet Statistics** | **B-C-A-B** |
|---|---|
| Statistics for the Ethernet port are also available from the Ethernet Statistics screen on the SCM card (**B-B-D**) and for the internal Ethernet port (eth1) on the MCP card (**B-B-D**). | |
| **Port** – eth1/eth2. Enter the Ethernet port for which you want to display statistics. | |
| **Packets Received** – Number of packets received from the selected Ethernet connection. | |
| **Bytes Received** – Number of bytes received from the selected Ethernet connection. | |
| **Errored Packets Received** – Number of errored packets received from the selected Ethernet connection. | |
| **Packets Sent** – Number of packets sent to the selected Ethernet connection. | |
| **Bytes Sent** – Number of bytes sent to the selected Ethernet connection. | |
| **Transmit Errors** – The number of transmit errors detected. | |
| **Collisions Detected** – The number of collisions detected. | |

## Displaying Multi Protocol Over ATM (MPOA) Statistics

To display Multi Protocol over ATM (MPOA) statistics, follow this menu selection sequence:

*Monitoring→Interfaces →Inband Management→Protocol Stats* (**B-C-A-C**)

The Protocol over ATM Statistics screen appears.



```
 Protocol over ATM Statistics          VoDSL

 Packets Received:                 0
 Packets Received
  with Unknown Protocols:          0
 Bytes Received:                   0

 Packets Sent:                     0
 Bytes Sent:                       0







 Enter "Control r" to reset statistics counters.

Press Enter to Continue
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

### NOTES:

- — All counters are updated every time the screen is refreshed. You may press Ctrl-r at any time to reset the User interface and SNMP interface statistical counters.
- — All counters are 32-bit wrap counters and wrap to zero once the maximum is reached.

The Protocol over ATM Statistics screen displays the information listed in Table 5-13, Protocol over ATM Statistics Screen.

**Table 5-13. Protocol over ATM Statistics Screen**

| **Inband Management**<br>**Protocol Stats (Protocol over ATM Statistics)** | **B-C-A-C** |
|---|---|
| **Packets Received** – Number of packets received from the Network.<br>**Packets Received with Unknown Protocols** – Number of errored packets received from the Network with an unknown protocol.<br>**Bytes Received** – Number of bytes received from the Network.<br>**Packets Sent** – Number of packets sent to the Network.<br>**Bytes Sent** – Number of bytes sent to the Network. | |

## Displaying AAL5 SAR Statistics

AAL5 SAR statistics provide statistics on the segmentation of packets received from the MCP card into cells and the reassembly of cells received from the network into packets.

The Inband Mgt AAL5 SAR Statistics screen displays the information listed in Table 5-14, Inband Mgt AAL5 SAR Statistics Screen.

**Table 5-14. Inband Mgt AAL5 SAR Statistics Screen**

**Inband Management**
**Inband Mgt AAL5 SAR Statistics** **B-C-A-D**

**Packets Received** – Number of AAL5 CPCS PDUs packets received from the ATM Network and sent to the MPOA layer.

**Errored Packets Received** – Number of errored AAL5 CPCS PDUs packets received from the ATM Network. Errors counted include CRC-32, SAR timeout and oversized SDUs.

**Received ATM Packets Discarded** – Number of AAL5 CPCS PDUs packets discarded due to input buffer overflow, etc.

**Bytes Received** – Number of AAL5 CPCS PDUs bytes received from the ATM Network.

**Packets Sent** – Number of AAL5 CPCS PDUs sent to the ATM Network. The number of AAL5 PDUs actually transmitted is the number received from a higher layer for transmission minus any counted as errors or discards.

**Errored Packets not Transmitted** – Number of AAL5 CPCS PDUs packets that could not be sent to the ATM Network due to errors.

**Packets Discarded Before Transmission** – Number of AAL5 CPCS PDUs packets that were received for transmission to the ATM Network, but were discarded due to output buffer overflow, etc.

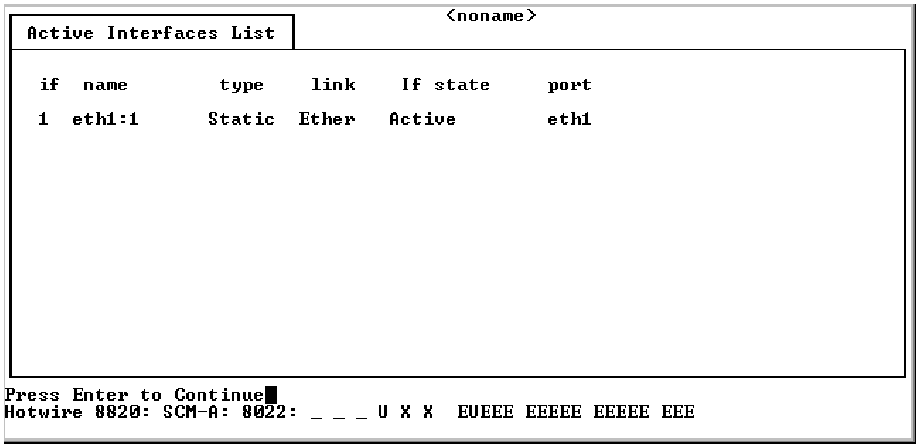
**Bytes Sent** – Number of AAL5 CPCS PDU bytes sent to the ATM Network.

## Displaying Active Interfaces List

To display the SCM card interfaces, follow this menu selection sequence:

*Monitoring→Interfaces →Active List* (**B-C-B**)

The Active Interfaces List screen appears.



```
                                        <noname>
 Active Interfaces List

  if   name        type    link    If state     port
  1   eth1:1      Static  Ether   Active       eth1

Press Enter to Continue
Hotwire 8820: SCM-A: 8022: _ _ _ U X X  EUEEE EEEEE EEEEE EEE
```

The Active Interfaces List screen displays the information listed in Table 5-15, Active Interfaces List.

**Table 5-15. Active Interfaces List**

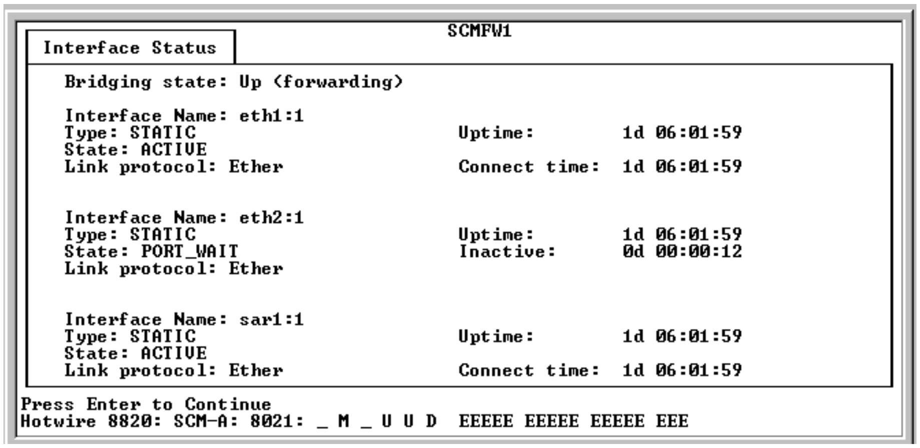
| **Active Interfaces List** | **B-C-B** |
|---|---|
| Lists all SCM card interfaces along with the following information:<br>**if** – Number of the interface.<br>**name** – Interface name as follows:<br>■ Eth1:1 = Internal Ethernet interface to the MCP card<br>■ Eth2:1 = External Ethernet interface<br>■ SAR1:1 = SAR interface to the SCM card’s ATM switch<br>**type** – Displays Static.<br>**link** – A description of the protocol on the interface (Ethernet, RFC 1483 Bridged, ATM).<br>**If state** – Displays Active as the current state of the interface.<br>**port** – Ethernet port (Eth1, Eth2, SAR). | |

## Displaying Interface Status

To display the SCM card interfaces, follow this menu selection sequence:

*Monitoring*→*Interfaces* →*Status* (**B-C-C**)

The Interface Status screen appears.



```
 Interface Status                       SCMFW1
   Bridging state: Up (forwarding)

   Interface Name: eth1:1
   Type: STATIC                       Uptime:       1d 06:01:59
   State: ACTIVE
   Link protocol: Ether               Connect time: 1d 06:01:59


   Interface Name: eth2:1
   Type: STATIC                       Uptime:       1d 06:01:59
   State: PORT_WAIT                   Inactive:     0d 00:00:12
   Link protocol: Ether


   Interface Name: sar1:1
   Type: STATIC                       Uptime:       1d 06:01:59
   State: ACTIVE
   Link protocol: Ether               Connect time: 1d 06:01:59
Press Enter to Continue
Hotwire 8820: SCM-A: 8021: _ M _ U U D  EEEEE EEEEE EEEEE EEE
```

The Interface Status screen displays the information listed in Table 5-16, Interface Status.

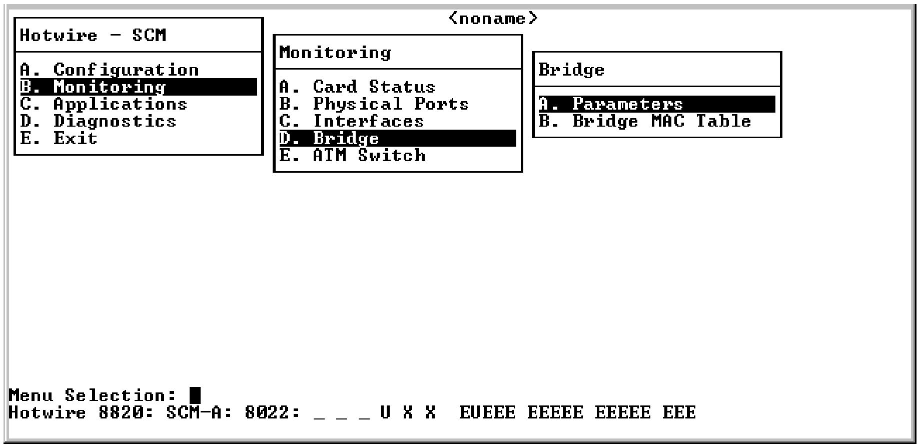
**Table 5-16. Interface Status**

| **Interface Status** | **B-C-C** |
|---|---|
| Lists the status for all three SCM card interfaces.<br>**Bridging state** – State of the bridge interface.<br>**Interface Name** – Interface name as follows:<br>■ Eth1:1 = Internal Ethernet interface to the MCP card<br>■ Eth2:1 = External Ethernet interface<br>■ SAR1:1 = SAR interface to the SCM card's ATM switch<br>**Type** – Displays STATIC.<br>**State** – Current state of the interface:<br>■ ACTIVE – Port is enabled and running.<br>■ PORT_WAIT – Port is enabled, but not connected to the interface.<br>■ ZOMBIE – Port is disabled.<br>**Link protocol** – A description of the protocol on the interface (Ethernet, RFC 1483 Bridged, ATM).<br>**Uptime** – The length of time that the interface has been available. If the interface is not disabled, this represents the length of time since the SCM card was last powered-on or reset.<br>**Inactive** – The length of time since the physical connection was removed.<br>**Connect Time** – The length of time that the physical connection has been present. | |

# Displaying Bridge Menu Options

To access the Bridge menu, follow this menu selection sequence:

*SCM Main Menu*→*Monitoring*→*Bridge* (**B-D**)



```
Menu Selection: █
Hotwire 8820: SCM-A: 8022: _ _ _ U X X  EUEEE EEEEE EEEEE EEE
```

The Bridge menu provides the following options:

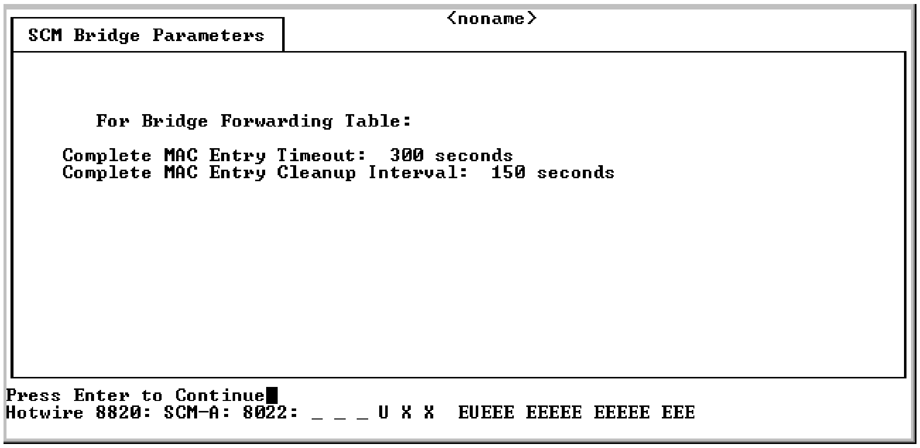
- **A. Parameters** – Displays the SCM Bridge Parameters.
- **B. Bridge MAC Table** – Displays the Bridge MAC Table.

## Displaying Bridge Parameters

To display the Bridge parameters, follow this menu selection sequence:

*Monitoring→ Bridge → Parameters* (**B-D-A**)

The SCM Bridge Parameters screen appears.



```
                                    <noname>
 SCM Bridge Parameters


       For Bridge Forwarding Table:

    Complete MAC Entry Timeout:  300 seconds
    Complete MAC Entry Cleanup Interval:  150 seconds







Press Enter to Continue
Hotwire 8820: SCM-A: 8022: _ _ _ U X X  EUEEE EEEEE EEEEE EEE
```

The SCM Bridge Parameters screen displays the information listed in Table 5-17, SCM Bridge Parameters Screen.

**Table 5-17. SCM Bridge Parameters Screen**

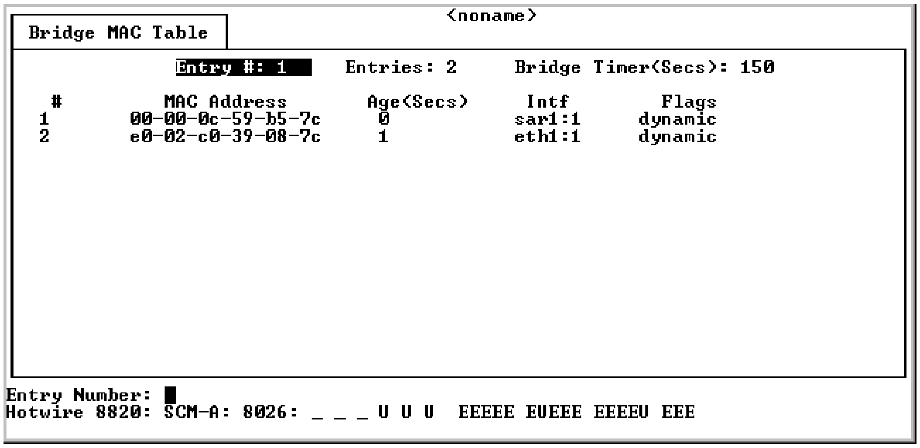
| **Bridge (SCM Bridge Parameters)** | **B-D-A** |
|---|---|
| **Complete MAC Entry Timeout** – The bridge MAC entry aging Timeout (10 – 1,000,000 seconds).<br>**Complete MAC Entry Cleanup Interval** – MAC Entry Timeout in seconds. The cleanup interval is typically set to half of the bridge MAC entry aging timeout. | |

## Displaying Bridge MAC Table Entries

To display the Bridge MAC Table entries, follow this menu selection sequence:

*Monitoring→ Bridge → Bridge MAC Table* (**B-D-B**)

The Bridge MAC Table screen appears.



```
                                        <noname>
 Bridge MAC Table
                 Entry #: 1      Entries: 2     Bridge Timer(Secs): 150

   #        MAC Address        Age(Secs)     Intf        Flags
  1       00-00-0c-59-b5-7c     0            sar1:1     dynamic
  2       e0-02-c0-39-08-7c     1            eth1:1     dynamic

Entry Number: █
Hotwire 8820: SCM-A: 8026: _ _ _ U U U  EEEEE EUEEE EEEEU EEE
```

The Bridge MAC Table screen displays the information listed in Table 5-18, Bridge MAC Table Screen.

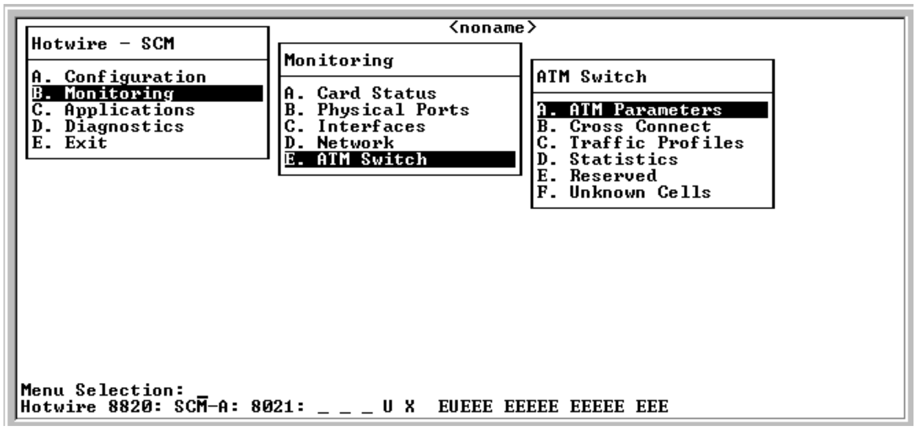
**Table 5-18. Bridge MAC Table Screen**

| **Bridge MAC Table** | **B-D-B** |
|---|---|
| **Entry #** – Enter the number of first entry that you want to display in the MAC table.<br>**Entries** – Total number of entries in the MAC Table (up to 256).<br>**Bridge Timer (Secs)** – The bridge MAC entry aging timeout (in seconds).<br>**MAC Address** – MAC address of this entry.<br>**Age (Secs)** – Time (in seconds) since this entry was last used.<br>**Intf** – The interface associated with this entry (SAR, Eth1 or Eth2).<br>**Flags** – Special flags for this entry (dynamic or permanent). | |

# Displaying ATM Switch Menu Options

To access the ATM menu, follow this menu selection sequence:

*SCM Main Menu→Monitoring→ATM Switch* (**B-E**)



```
Menu Selection: _
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

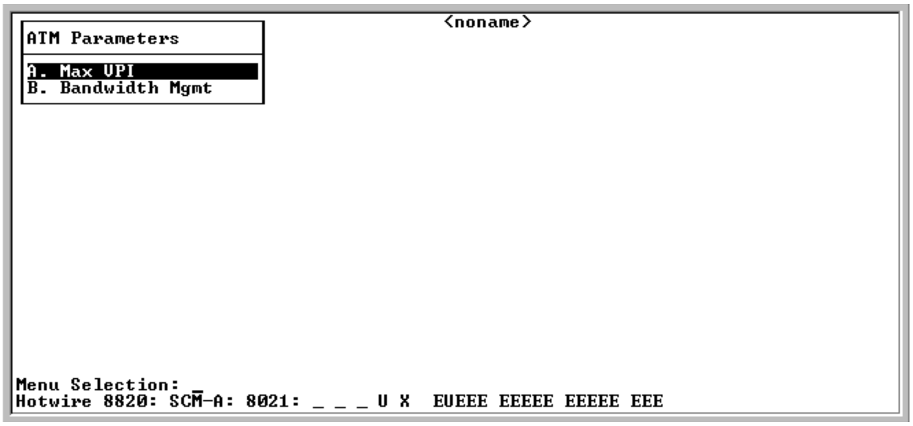
The ATM menu provides the following options:

- **A. ATM Parameters** – Displays the ATM Parameters menu.
- **B. Cross Connect** – Displays the ATM Cross Connect menu.
- **C. Traffic Profiles** – Displays the values configured on the ATM Traffic Profiles screen (**A-E-C**).
- **D. Statistics** – Displays the ATM Statistics menu.
- **E. Reserved** – Not applicable for this release.
- **F. Unknown Cells** – Provides an indication that the SCM is receiving cells with an unknown VPI or VCI header.

## Displaying ATM Parameters Menu Options

To access the ATM Parameters menu, follow this menu selection sequence:

*SCM Main Menu→Monitoring→ATM Switch →ATM Parameters* (**B-E-A**)



```
                                    <noname>
ATM Parameters

A. Max VPI
B. Bandwidth Mgmt

Menu Selection: _
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The ATM Parameters menu provides the following options:

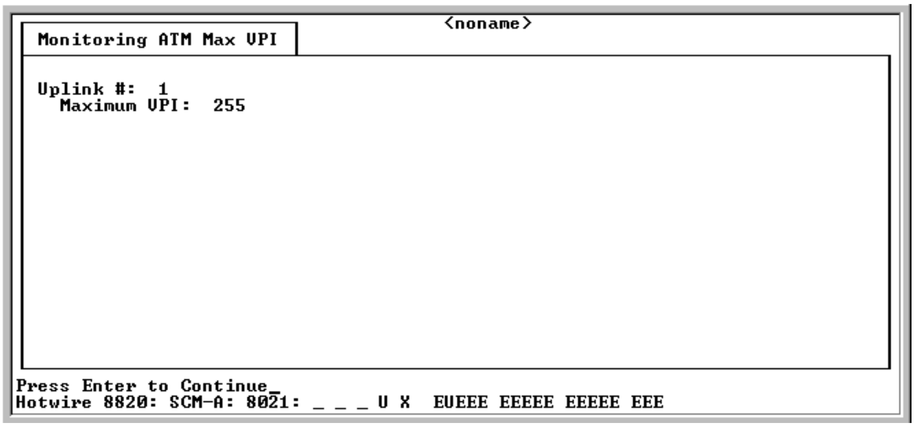
- **A. Max VPI** – Displays the default value on the Max VPI screen (**A-E-A-A**).
- **B. Bandwidth Mgmt.** – Displays the values configured on the ATM Bandwidth Management screen (**A-E-A-B**).

## Displaying Max VPI Parameters

To display the Max VPI parameters, follow this menu selection sequence:

*Monitoring→ATM Switch →ATM Parameters →Max VPI* (**B-E-A-A**)

The Monitoring ATM Max VPI screen appears.



```
                                          <noname>
 Monitoring ATM Max VPI

 Uplink #:  1
   Maximum VPI:  255










Press Enter to Continue_
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The Monitoring ATM Max VPI screen displays the information listed in Table 5-19, Monitoring ATM Max VPI Screen.

**Table 5-19. Monitoring ATM Max VPI Screen**

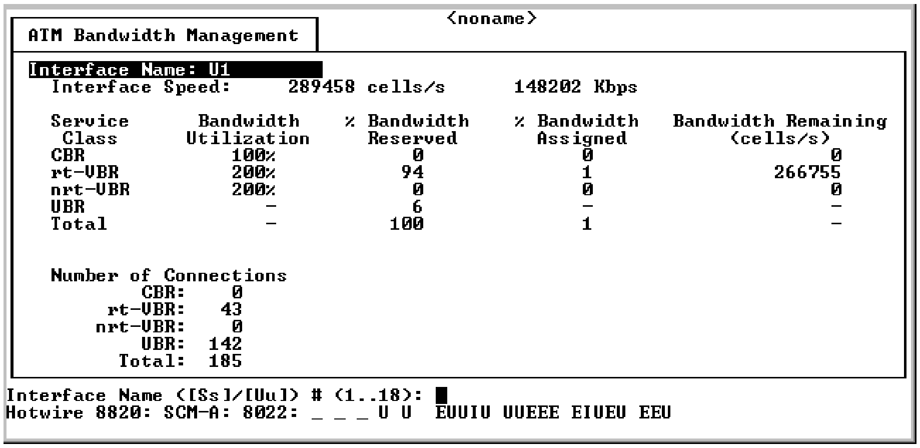
| **ATM Parameters**<br>**ATM Max VPI (Monitoring ATM Max VPI)** | **B-E-A-A** |
|---|---|
| **Uplink #** – Displays 1.<br>**Maximum VPI** – Displays the maximum VPI value supported by this uplink (255). This field currently defaults to a value of 255. | |

## Displaying Bandwidth Management Parameters

To display the ATM Bandwidth Management parameters, follow this menu selection sequence:

*Monitoring→ATM Switch →ATM Parameters →Bandwidth Mgmt.* (**B-E-A-B**)

The ATM Bandwidth Management screen appears.



```
                                   <noname>
 ATM Bandwidth Management
 Interface Name: U1
   Interface Speed:     289458 cells/s      148202 Kbps

   Service       Bandwidth    % Bandwidth    % Bandwidth   Bandwidth Remaining
    Class       Utilization     Reserved       Assigned        (cells/s)
   CBR              100%           0              0                    0
   rt-VBR           200%          94              1               266755
   nrt-VBR          200%           0              0                    0
   UBR                -            6              -                    -
   Total              -          100              1                    -


   Number of Connections
           CBR:    0
        rt-VBR:   43
       nrt-VBR:    0
           UBR:  142
         Total:  185
Interface Name ([Ss]/[Uu]) # (1..18): █
Hotwire 8820: SCM-A: 8022: _ _ _ U U  EUUIU UUEEE EIUEU EEU
```

The ATM Bandwidth Management screen displays the information listed in Table 5-20, ATM Bandwidth Management Screen.

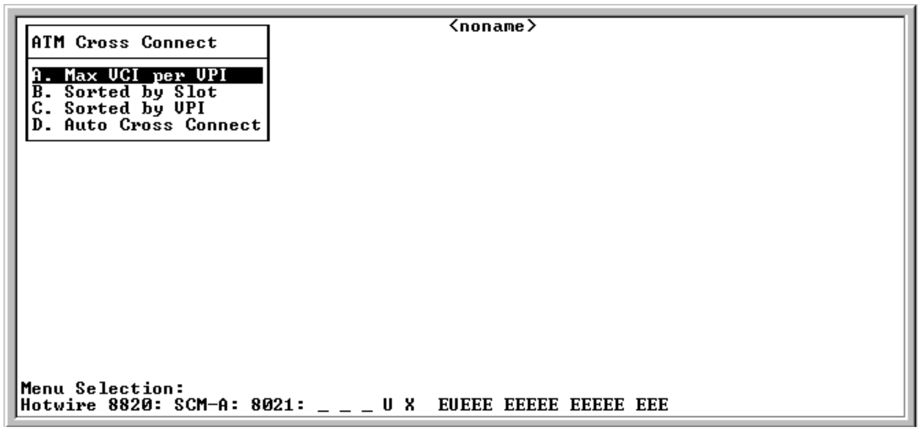
**Table 5-20. ATM Bandwidth Management Screen**

| **ATM Parameters**<br>**Bandwidth Mgmt. (ATM Bandwidth Management)** **B-E-A-B** |
|---|
| **Interface Name** – Select the interface for which you wish to display Bandwidth Utilization parameters (S1–S18 for Slots 1–18 depending on chassis type, or U1 for Uplink 1). |
| **Interface Speed** – Displays the actual speed of the interface in cells per second and kilobits per second. |
| **Service Class** – The class of service for this connection. Cells are switched based on priority of service class. Classes listed below in priority order (highest to lowest):<br>■ CBR = Constant Bit Rate<br>■ rt-VBR = Real Time Variable Bit Rate for voice traffic<br>■ nrt-VBR = Nonreal Time Variable Bit Rate for Frame Relay traffic<br>■ UBR = Unspecified Bit Rate for packet data |
| **Bandwidth Utilization** – The percent of bandwidth utilization (oversubscription) the CAC will allow for each service class. |
| **% Bandwidth Reserved** – If this value reaches 100%, no new guaranteed connections can be added. |
| **% Bandwidth Assigned** – The percent of the total bandwidth assigned by the CAC function to existing cross connections of each service class. |
| **Bandwidth Remaining (Cells/s)** – The bandwidth available to allocate new connections for each service class. |
| **Number of Connections** – The number of connections assigned to each service class. |

## Displaying ATM Cross Connect Menu Options

To access the ATM Cross Connect menu, follow this menu selection sequence:

*SCM Main Menu→Monitoring→ATM Switch →Cross Connect* (**B-E-B**)



```
                                        <noname>
ATM Cross Connect

A. Max VCI per VPI
B. Sorted by Slot
C. Sorted by VPI
D. Auto Cross Connect

Menu Selection:
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The ATM Cross Connect menu provides the following options:

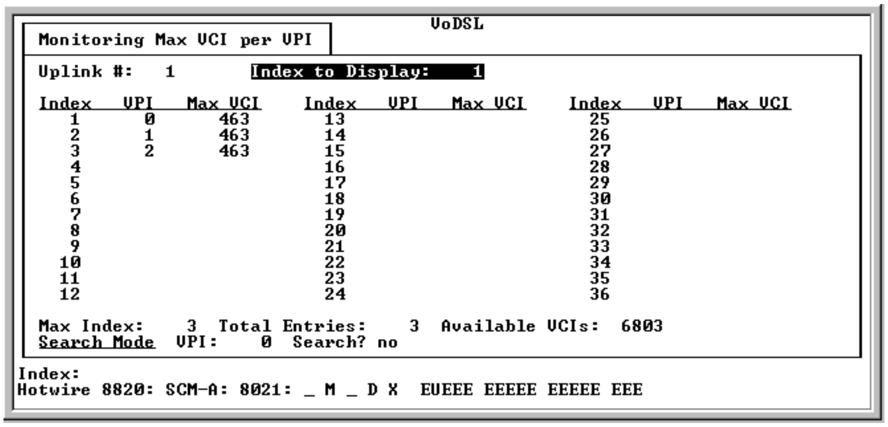
- **A. Max VCI per VPI** – Displays the maximum number of VCIs that will be supported by each of the uplink’s VPIs.
- **B. Sorted by Slot** – Displays the cross connects configured and sorted by slot number.
- **C. Sorted by VPI** – Displays the VCs configured and sorted by VPI.
- **D. Auto Cross Connect** – Displays the sets of parameters used to automatically generate the cross connections for the standard, default connections for each port card.

## Displaying Max VCI per VPI

To display the maximum number of VCIs configured for each of the uplink’s VPIs, follow this menu selection sequence:

*Monitoring→ATM Switch→ Cross Connect →Max VCI per VPI* (**B-E-B-A**)

The Monitoring Max VCI per VPI screen appears.



```
                                          VoDSL
 Monitoring Max VCI per VPI
 Uplink #:   1        Index to Display:     1

 Index   VPI    Max VCI     Index   VPI    Max VCI     Index   VPI    Max VCI
    1     0       463         13                         25
    2     1       463         14                         26
    3     2       463         15                         27
    4                         16                         28
    5                         17                         29
    6                         18                         30
    7                         19                         31
    8                         20                         32
    9                         21                         33
   10                         22                         34
   11                         23                         35
   12                         24                         36

 Max Index:    3  Total Entries:    3  Available VCIs:  6803
 Search Mode  VPI:    0  Search? no
Index:
Hotwire 8820: SCM-A: 8021: _ M _ D X  EVEEE EEEEE EEEEE EEE
```

### NOTE:

If a VPI has not been assigned any VCIs, it will not be assigned an item number and will not be displayed on this screen.

The Monitoring Max VCI per VPI screen displays the information listed in Table 5-21, Monitoring Max VCI per VPI Screen.

**Table 5-21. Monitoring Max VCI per VPI Screen**

| **Cross Connect**<br>**Max VCI per VPI (Monitoring Max VCI per VPI) B-E-B-A** |
|---|
| NOTE: Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.<br>**Uplink #** – Displays 1.<br>**Index to Display** – Enter the item number of the record to be displayed.<br>**Index** – Identifies the item/record displayed.<br>**VPI** – The number of any VPI supported by the uplink – 0–255 (Default = 0).<br>**Max VCI** – The maximum VCI value configured for the VPI on this uplink – 1–8191 (Default = 463 for VPI 0 and 1).<br>**Max Index** – Displays the total number of entries in display memory. The first entry is determined by your search. Each entry is given an index number. The total number of entries possible is a maximum of 100 or up to the end of the database, whichever comes first. The number displayed in this field determines the largest number that you may enter into the Index field at the bottom of the screen.<br>**Total Entries** – Displays the total number of uplink VPIs that have been assigned at least one VCI.<br>**Available VCIs** – Displays the number of VCIs that have not already been assigned to a VPI (Maximum = 8191).<br>**Search Mode** – Allows you to search the database for VPI records to display.<br>**VPI** – Enter the number of the VPI record you wish to display. The database display will start with this VPI record.<br>**Search?** – Enter Yes to start a search of the database, beginning with the record you defined in the VPI field. |

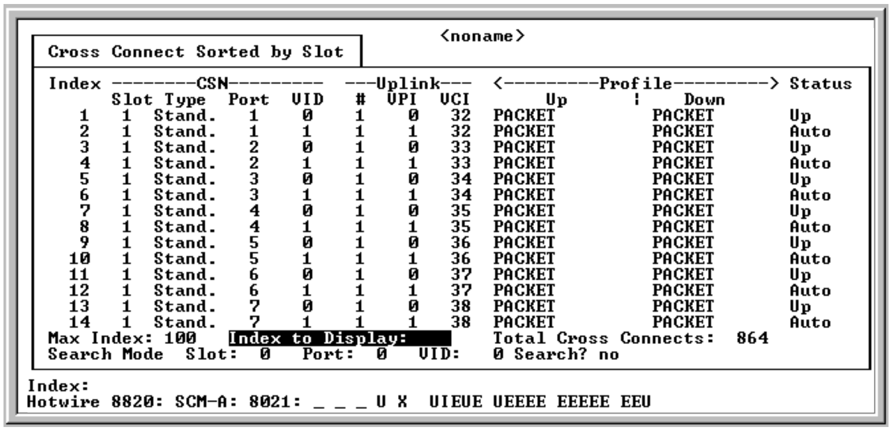
## Displaying Cross Connects

The Cross Connect Table can be sorted by slot or by VPI. The screen appearance is different, but the content is the same.

To display the Cross Connect Table sorted by slot, follow this menu selection sequence:

*Monitoring→ATM Switch→Cross Connect→Sorted by Slot* (**B-E-B-B**)

The Cross Connect Sorted By Slot screen appears.

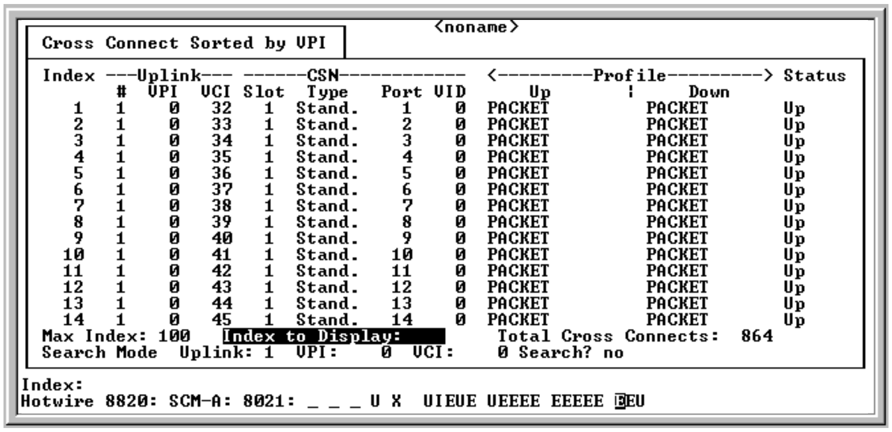


```
                                          <noname>
 Cross Connect Sorted by Slot
 Index --------CSN---------  ---Uplink---  <---------Profile---------> Status
       Slot Type  Port  VID   #  VPI  VCI      Up       :      Down
   1    1  Stand.  1     0    1    0   32  PACKET           PACKET      Up
   2    1  Stand.  1     1    1    1   32  PACKET           PACKET      Auto
   3    1  Stand.  2     0    1    0   33  PACKET           PACKET      Up
   4    1  Stand.  2     1    1    1   33  PACKET           PACKET      Auto
   5    1  Stand.  3     0    1    0   34  PACKET           PACKET      Up
   6    1  Stand.  3     1    1    1   34  PACKET           PACKET      Auto
   7    1  Stand.  4     0    1    0   35  PACKET           PACKET      Up
   8    1  Stand.  4     1    1    1   35  PACKET           PACKET      Auto
   9    1  Stand.  5     0    1    0   36  PACKET           PACKET      Up
  10    1  Stand.  5     1    1    1   36  PACKET           PACKET      Auto
  11    1  Stand.  6     0    1    0   37  PACKET           PACKET      Up
  12    1  Stand.  6     1    1    1   37  PACKET           PACKET      Auto
  13    1  Stand.  7     0    1    0   38  PACKET           PACKET      Up
  14    1  Stand.  7     1    1    1   38  PACKET           PACKET      Auto
 Max Index: 100   Index to Display:         Total Cross Connects:  864
 Search Mode  Slot:  0   Port:  0   VID:    0 Search? no

Index:
Hotwire 8820: SCM-A: 8021: _ _ _ U X  UIEUE UEEEE EEEEE EEU
```

To display the Cross Connect Table sorted by VPI, follow this menu selection sequence:

*Monitoring→ATM Switch→Cross Connect→Sorted by VPI* (**B-E-B-C**)

The Cross Connect Sorted By VPI screen appears.



```
                                          <noname>
 Cross Connect Sorted by VPI
 Index ---Uplink--- ------CSN------------  <---------Profile---------> Status
        #  VPI  VCI Slot  Type     Port VID     Up       :      Down
   1    1    0   32   1  Stand.      1    0  PACKET           PACKET      Up
   2    1    0   33   1  Stand.      2    0  PACKET           PACKET      Up
   3    1    0   34   1  Stand.      3    0  PACKET           PACKET      Up
   4    1    0   35   1  Stand.      4    0  PACKET           PACKET      Up
   5    1    0   36   1  Stand.      5    0  PACKET           PACKET      Up
   6    1    0   37   1  Stand.      6    0  PACKET           PACKET      Up
   7    1    0   38   1  Stand.      7    0  PACKET           PACKET      Up
   8    1    0   39   1  Stand.      8    0  PACKET           PACKET      Up
   9    1    0   40   1  Stand.      9    0  PACKET           PACKET      Up
  10    1    0   41   1  Stand.     10    0  PACKET           PACKET      Up
  11    1    0   42   1  Stand.     11    0  PACKET           PACKET      Up
  12    1    0   43   1  Stand.     12    0  PACKET           PACKET      Up
  13    1    0   44   1  Stand.     13    0  PACKET           PACKET      Up
  14    1    0   45   1  Stand.     14    0  PACKET           PACKET      Up
 Max Index: 100   Index to Display:          Total Cross Connects:  864
 Search Mode  Uplink: 1  VPI:    0  VCI:      0 Search? no

Index:
Hotwire 8820: SCM-A: 8021: _ _ _ U X  UIEUE UEEEE EEEEE EEU
```

The Monitoring Cross Connect screens display the information listed in Table 5-22, Cross Connect Screens.

**Table 5-22. Cross Connect Screens (1 of 2)**

| **Cross Connect (ATM Cross Connect)** | |
|---|---|
| **Sorted By Slot** | **B-E-B-B** |
| **Sorted By VPI** | **B-E-B-C** |

The list of fields below is presented in the order shown on the ATM Cross Connects Sorted By Slot screen (**B-E-B-B**).

> NOTE: Any SNMP set changes made while this screen is open will not display until you exit this screen, then reenter it.

**Index** – Enter the index number associated with the cross connect record.

**CSN** – The following fields define the Connection Serial Number (CSN) used for making the connection through the system. The format is slot (1–18), connection type (Standard or Custom), port (1–24), VID.

**Slot** – The slot number (1–18, depending on chassis type) of the DSL port card associated with the connection.

**Type** – Defines the cross connection type as:

- Standard = Port maps to its own uplink VPI/VCI and is automatically assigned a dedicated internal VNID/VPI/VCI. This is the default.
- Custom = Define VNID bridge groups to packet port cards, or connections in addition to default connections to cell port cards.

**Port** – The number of the port (1–24, depending on port card type) associated with the connection.

**VID** – For connections to packet port cards, the number used to identify the custom connection (2–255). Each VNID number can be used to identify only one custom connection on a port card, but this connection can be associated with more than one of that DSL port card's ports. The same VNID number can be used by multiple DSL port cards. The VNID assigned on the port card must match the VID on the SCM for custom connections.

For connections to cell port cards, the VID is an internal virtual circuit assigned by the port card. You can view the CSN on the port card cross connect table. There are two standard cross connects per card on VID 0 and 1. All other cross connects are custom, and the last three digits of the port card CSN must match the VID on the SCM card's CSN.

**Uplink** – The following fields define the uplink:

**#** – Displays 1. (This field is read-only.)

**VPI** – The number of the uplink VPI (0–255) associated with the connection.

**VCI** – The number of the uplink VCI associated with the connection (1–maximum VCI). The maximum value allowed is determined by what was configured on the Max VCI per VPI screen (**A-E-B-A**).

**Table 5-22. Cross Connect Screens (2 of 2)**

**Cross Connect (ATM Cross Connect)**
**Sorted By Slot** **B-E-B-B**
**Sorted By VPI** **B-E-B-C**
***(continued)***

**Profile** – The following fields bind one or two of the predefined traffic profiles (**A-E-C**) to the cross connection. The default is PACKET. Each profile name entered is verified against the set of traffic profile names defined on the ATM Traffic Profiles screen (**A-E-C**). Profile names are case-sensitive. Cell port cards (e.g., Models 8335, 8365) are assigned PACKET on Channel 0 and Voice on Channel 1. Packet port cards (e.g., Model 8303, 8314, etc.) are assigned PACKET on Channels 0 and 1 by default.

**Up** – Used for upstream profiles (port card to SCM to uplink). It is not an indication that the port on the DSL port card is up.

**Down** – Used for downstream profiles (uplink to SCM to port card). Downstream is the same as upstream for symmetric traffic.

**Status** – Displays the status of the connection:

- Auto = A valid cross connection has been defined, but the slot associated with the Auto connection is empty or contains a card that is inconsistent with the defined Auto connection, and this connection has not achieved an Up status since the last time the SCM card was reset. The Auto status will change to Up once a port card consistent with the defined Auto connection is inserted in this slot. Once this connection achieves an Up status, it will never again assume Auto status unless the SCM card is reset.
- Up = A valid cross connection has been defined and a DSL port card matching the the connection’s parameters exists in the chassis.
- Down = A valid cross connection has been defined, but there is no card in the slot defined by the cross connection, and this is a user- or SNMP-initiated connection or an Auto connection that has had an Up status since the SCM card was last reset.
- CfgErr = A valid cross connection has been defined, but the port card in the slot defined by the cross connection is not compatible with the SCM card operation or is not consistent with what is entered in the Port field. Also, this is a user- or SNMP-initiated connection or an Auto connection that has had an Up status since the SCM card was last reset.

**Max Index** – Displays the total number of entries in the index. The first entry in the index is determined by your search. The total number of entries possible in the index is a maximum of 100 or up to the end of the database, whichever comes first. The number displayed in this field determines the largest number that you may enter into the Index field at the bottom of the screen.

**Total Cross Connects** – The number of user connections defined for this uplink.

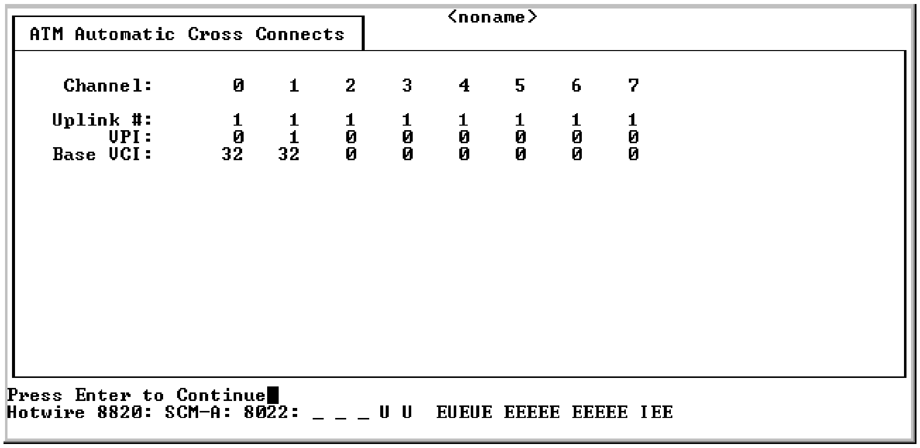
**Search Mode** – Select where to start the data base display (Slot, Port, VNID number for **B-E-B-B** or VPI, VCI for **B-E-B-C**). Enter yes in the Search? field to start the search.

## Displaying Automatic Cross Connection Parameters

To display values used to set up standard cross connections, follow this menu selection sequence:

*Monitoring→ATM Switch→Cross Connect→Auto Cross Connect* (**B-E-B-D**)

The ATM Automatic Cross Connects screen appears.



```
 ATM Automatic Cross Connects          <noname>

   Channel:       0    1    2    3    4    5    6    7

  Uplink #:       1    1    1    1    1    1    1    1
       VPI:       0    1    0    0    0    0    0    0
  Base VCI:      32   32    0    0    0    0    0    0

Press Enter to Continue█
Hotwire 8820: SCM-A: 8022: _ _ _ U U  EUEUE EEEEE EEEEE IEE
```

The ATM Automatic Cross Connects screen displays the information listed in Table 5-23, ATM Automatic Cross Connects Screen.

**Table 5-23. ATM Automatic Cross Connects Screen**

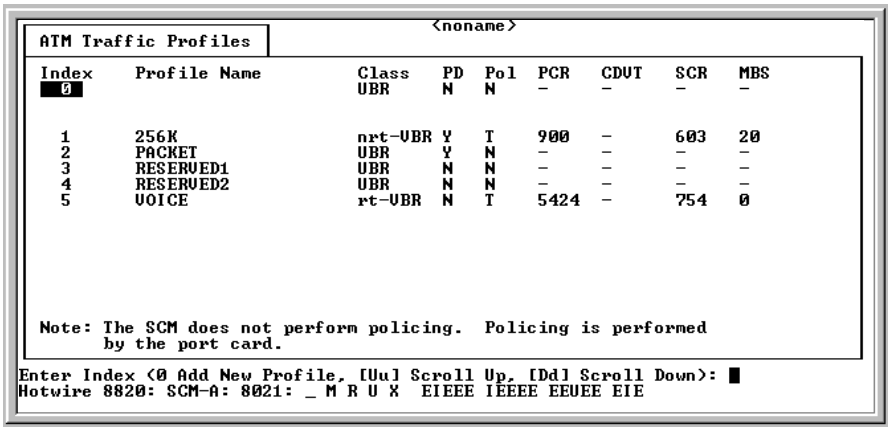
| **Cross Connect**<br>**Auto Cross Connect (ATM Automatic Cross Connects)** | **B-E-B-D** |
|---|---|
| Displays the default VPI and VCI values for the auto cross connect operation of the SCM card for up to 8 channels. A channel is a logical name for a grouping of default connections of a specific type.<br>NOTE: The auto cross connect feature is disabled for a channel with VPI and Base VCI fields both set to 0.<br>**Uplink #** – FIxed at 1.<br>**VPI** – Displays the number of the VPI used for all connections defined by the Automatic Cross Connect function (Channels 0 and 2–8 Default = 0, Channel 1 Default = 1).<br>**Base VCI** – Displays the starting VCI value used for the automatic cross connects (Channels 0–1 Default = 32, Channels 2–8 Default = 0). | |

## Displaying Traffic Profiles

To display traffic profiles, follow this menu selection sequence:

*Monitoring*→*ATM Switch*→*Traffic Profiles* (**B-E-C**)

The ATM Traffic Profiles screen appears.



```
                                                  <noname>
 ATM Traffic Profiles
  Index    Profile Name         Class   PD  Pol  PCR    CDVT    SCR    MBS
    0                           UBR     N   N    -      -       -      -


    1      256K                 nrt-VBR Y   T    900    -       603    20
    2      PACKET               UBR     Y   N    -      -       -      -
    3      RESERVED1            UBR     N   N    -      -       -      -
    4      RESERVED2            UBR     N   N    -      -       -      -
    5      VOICE                rt-VBR  N   T    5424   -       754    0






  Note: The SCM does not perform policing.  Policing is performed
        by the port card.
Enter Index (0 Add New Profile, [Uu] Scroll Up, [Dd] Scroll Down): █
Hotwire 8820: SCM-A: 8021: _ M R U X  EIEEE IEEEE EEUEE EIE
```

The ATM Traffic Profiles screen displays the information listed in Table 5-24, ATM Traffic Profiles Screen. Traffic profiles are displayed alphabetically, with all uppercase profiles (default profiles) displayed first, followed by lowercase profiles.

**Table 5-24. ATM Traffic Profiles Screen**

**Traffic Profiles (ATM Traffic Profiles)** **B-E-C**

Traffic profiles are displayed alphabetically with uppercase profiles (usually the default profiles) displayed first, followed by lowercase profiles.

**Index** – Enter the index number of the item you wish to display.

**Profile Name** – Specifies the name of the traffic profile.

**Class** – Specifies the class of service for this connection. Cells are switched based on priority of the service class. Classes listed below in priority order (highest to lowest):

- CBR = Constant Bit Rate
- rt-VBR = Real Time Variable Bit Rate
- nrt-VBR = Nonreal Time Variable Bit Rate
- UBR = Unspecified Bit Rate

**PD** – Displays whether the SCM card uses the Packet Discard feature when congestion is detected. Valid only for traffic with packet data using AAL5.

**POL** – Displays the type of policing supplied by the ATM SDSL port card:

- N = None. The ATM SDSL card does not provide policing.
- T = Tag. Nonconforming cells are tagged and forwarded to the SCM card with the CLP bit set.
- D = Drop. Nonconforming cells are dropped by the ATM SDSL card.

**PCR** – Displays the Peak Cell Rate (PCR).

**CDVT** – Displays the Cell Delay Variation Tolerance (CDVT) in microseconds.

**SCR** – Displays the Sustained Cell Rate (SCR).

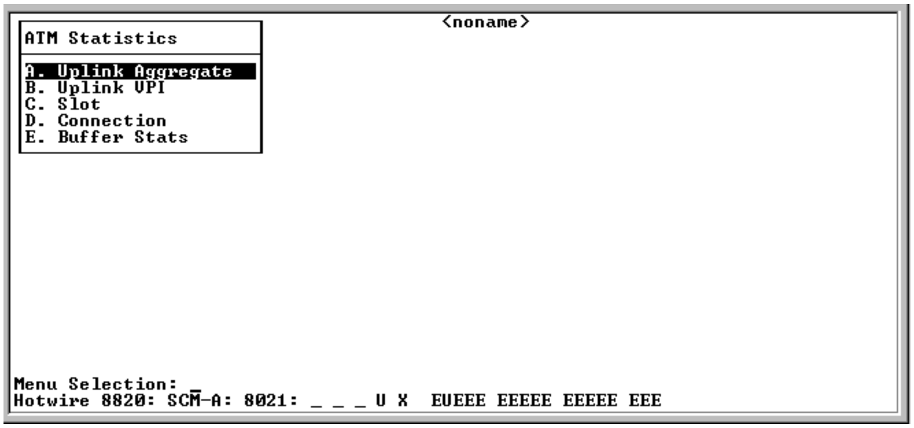
**MBS** – Displays the Maximum Burst Size (MBS).

**Total Profiles** – Displays the number of profiles that have been defined.

## Displaying ATM Statistics

To display ATM statistics, follow this menu selection sequence:

*Monitoring→ATM Switch→Statistics* (**B-E-D**)



```
                                   <noname>
ATM Statistics

A. Uplink Aggregate
B. Uplink VPI
C. Slot
D. Connection
E. Buffer Stats

Menu Selection: _
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The ATM Statistics menu provides the following options:

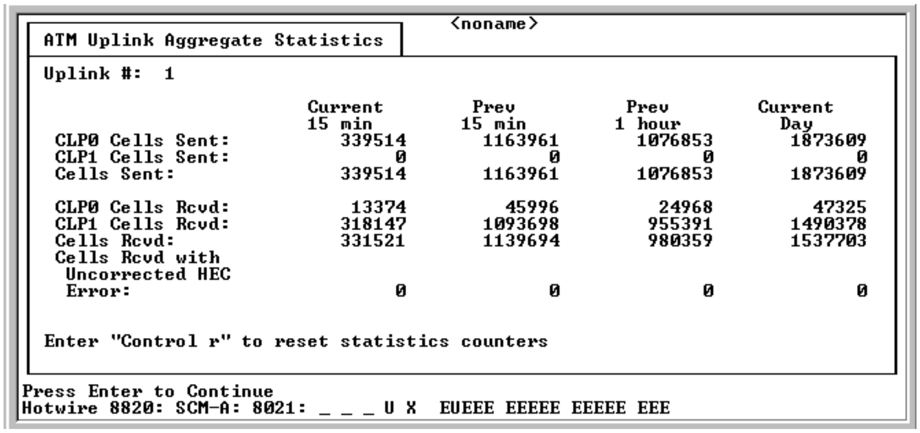
- **A. Uplink Aggregate** – Statistics for SCM card's uplink.
- **B. Uplink VPI** – Aggregate statistics for VPI number specified for the SCM card's uplink.
- **C. Slot** – Aggregate ATM statistics for SCM's backplane interface to a port card in a specific slot in the chassis.
- **D. Connection** – Individual VC statistics for one or two SCM connections.
- **E. Buffer Stats** – SCM buffer statistics.

## Displaying ATM Uplink Aggregate Statistics

To display aggregate ATM statistics associated with the SCM card’s uplink, follow this menu selection sequence:

*Monitoring→ATM Switch→Statistics→Uplink Aggregate* (**B-E-D-A**)

The ATM Uplink Aggregate Statistics screen appears.



```
                                       <noname>
  ATM Uplink Aggregate Statistics
  Uplink #:  1

                          Current        Prev          Prev        Current
                          15 min        15 min        1 hour         Day
   CLP0 Cells Sent:          339514       1163961       1076853       1873609
   CLP1 Cells Sent:               0             0             0             0
   Cells Sent:               339514       1163961       1076853       1873609

   CLP0 Cells Rcvd:           13374         45996         24968         47325
   CLP1 Cells Rcvd:          318147       1093698        955391       1490378
   Cells Rcvd:               331521       1139694        980359       1537703
   Cells Rcvd with
    Uncorrected HEC
    Error:                        0             0             0             0


  Enter "Control r" to reset statistics counters

Press Enter to Continue
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

### NOTES:

- — Statistics will not be accumulated on data received from the network if the uplink is in any local diagnostic loopback.
- — All counters are updated every few seconds as the screen is refreshed. You may press Ctrl-r at any time to reset the User interface and SNMP interface statistical counters.
- — Statistics are kept for the present 15-minute period, previous 15-minute period, previous 1-hour period, and the current day period. The 1-hour and current day counters are updated every hour on the hour. The current day counter is cleared at midnight. All counters are synchronized to the MCP card’s real-time clock.

The ATM Uplink Aggregate Statistics screen displays the information listed in Table 5-25, ATM Uplink Aggregate Statistics Screen.

**Table 5-25. ATM Uplink Aggregate Statistics Screen**

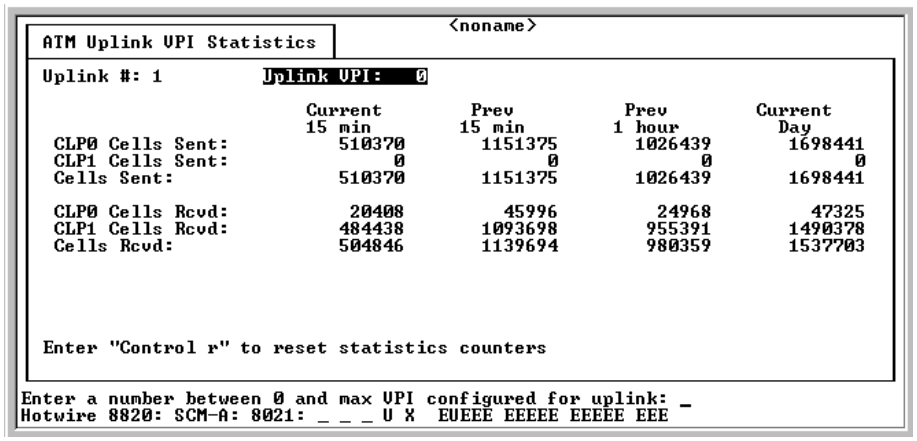
| **Statistics**<br>**Uplink Aggregate (ATM Uplink Aggregate Statistics) B-E-D-A** |
|---|
| **Uplink #** – Displays 1.<br>**CLP0 Cells Sent** – The number of ATM cells with the Cell Loss Priority (CLP) bit set to 0 sent to the remote device/Network by the uplink. CLP0 cells should be discarded last during periods of congestion.<br>**CLP1 Cells Sent** – The number of ATM cells with the CLP bit set to 1 sent to the remote device/Network by the uplink. CLP1 cells should be discarded first during periods of congestion.<br>**Cells Sent** – The total number of ATM cells sent to the remote device/Network by the uplink.<br>**CLP0 Cells Rcvd** – The number of ATM cells with the CLP bit set to 0 received from the remote device/Network by the uplink.<br>**CLP1 Cells Rcvd** – The number of ATM cells received with the CLP bit set to 1 from the remote device/Network by the uplink.<br>**Cells Rcvd** – The total number of ATM cells received from the remote device/Network by the uplink.<br>**Cells Rcvd with Uncorrected HEC Error** – The number of ATM cells received from the remote device/Network by the uplink with an uncorrectable HEC (header error correction). |

## Displaying ATM Uplink VPI Statistics

To display aggregate ATM statistics associated with a particular VPI of the SCM card's uplink, follow this menu selection sequence:

*Monitoring→ATM Switch→Statistics→Uplink VPI* (**B-E-D-B**)

The ATM Uplink VPI Statistics screen appears.



```
                                          <noname>
 ATM Uplink VPI Statistics
 Uplink #: 1           Uplink VPI:    0

                            Current       Prev          Prev         Current
                            15 min        15 min        1 hour        Day
  CLP0 Cells Sent:            510370       1151375       1026439       1698441
  CLP1 Cells Sent:                 0             0             0             0
  Cells Sent:                 510370       1151375       1026439       1698441

  CLP0 Cells Rcvd:             20408         45996         24968         47325
  CLP1 Cells Rcvd:            484438       1093698        955391       1490378
  Cells Rcvd:                 504846       1139694        980359       1537703




 Enter "Control r" to reset statistics counters

Enter a number between 0 and max VPI configured for uplink: _
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

### NOTES:

- — Statistics will not be accumulated on data received from the network if the uplink is in any diagnostic loopback.
- — All counters are updated every few seconds as the screen is refreshed. You may press Ctrl-r at any time to reset the User interface and SNMP interface statistical counters.
- — Statistics are kept for the present 15-minute period, previous 15-minute period, previous 1-hour period, and the current day period. The 1-hour and current day counters are updated every hour on the hour. The current day counter is cleared at midnight. All counters are synchronized to the MCP card's real-time clock.

The ATM Uplink VPI Statistics screen displays the information listed in Table 5-26, ATM Uplink VPI Statistics Screen.

**Table 5-26. ATM Uplink VPI Statistics Screen**

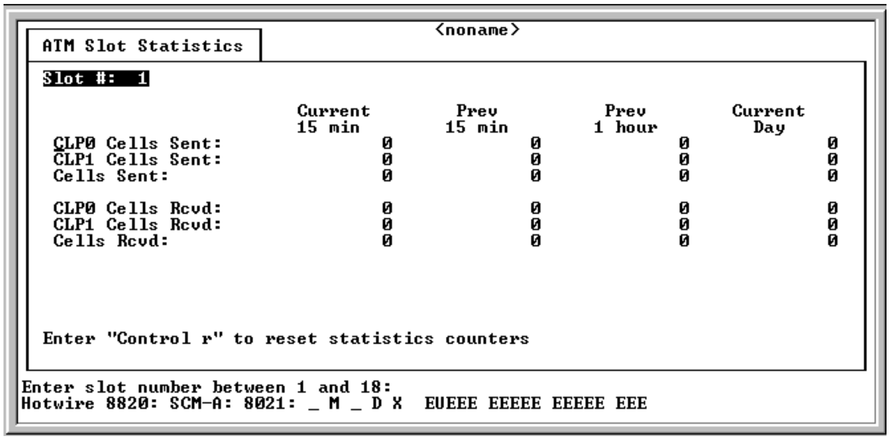
| **Statistics**<br>**Uplink VPI (ATM Uplink VPI Statistics) B-E-D-B** |
|---|
| **Uplink #** – Displays 1.<br>**Uplink VPI** – Enter the uplink VPI you wish to monitor.<br>**CLP0 Cells Sent** – The number of ATM cells with the Cell Loss Priority (CLP) bit set to 0 sent to the remote device/Network by the uplink.<br>**CLP1 Cells Sent** – The number of ATM cells with the CLP bit set to 1 sent to the remote device/Network by the uplink.<br>**Cells Sent** – The total number of ATM cells sent to the remote device/Network by the uplink.<br>**CLP0 Cells Rcvd** – The number of ATM cells with the CLP bit set to 0 received from the remote device/Network by the uplink.<br>**CLP1 Cells Rcvd** – The number of ATM cells with the CLP bit set to 1 received from the remote device/Network by the uplink.<br>**Cells Rcvd** – The total number of ATM cells received from the remote device/Network by the uplink.<br>NOTE: CLP1 cells may be discarded first during periods of congestion. |

## Displaying ATM Slot Statistics

To display aggregate ATM statistics associated with the SCM card's ATM backplane interface to a port card in a particular slot, follow this menu selection sequence:

*Monitoring→ATM Switch→Statistics→Slot* (**B-E-D-C**)

The ATM Slot Statistics screen appears.



```
                                       <noname>
  ATM Slot Statistics
  Slot #:  1

                          Current        Prev          Prev        Current
                          15 min        15 min        1 hour         Day
   CLP0 Cells Sent:               0             0             0             0
   CLP1 Cells Sent:               0             0             0             0
   Cells Sent:                    0             0             0             0

   CLP0 Cells Rcvd:               0             0             0             0
   CLP1 Cells Rcvd:               0             0             0             0
   Cells Rcvd:                    0             0             0             0



  Enter "Control r" to reset statistics counters

Enter slot number between 1 and 18:
Hotwire 8820: SCM-A: 8021: _ M _ D X  EUEEE EEEEE EEEEE EEE
```

### NOTES:

— Statistics will not be accumulated on data received from the network if the uplink is in any diagnostic loopback.

— All counters are updated every few seconds as the screen is refreshed. You may press Ctrl-r at any time to reset the User interface and SNMP interface statistical counters.

— Statistics are kept for the present 15-minute period, previous 15-minute period, previous 1-hour period, and the current day period. The 1-hour and current day counters are updated every hour on the hour. The current day counter is cleared at midnight. All counters are synchronized to the MCP card's real-time clock.

The ATM Slot Statistics Screen displays the information listed in Table 5-27, ATM Slot Statistics Screen.

**Table 5-27. ATM Slot Statistics Screen**

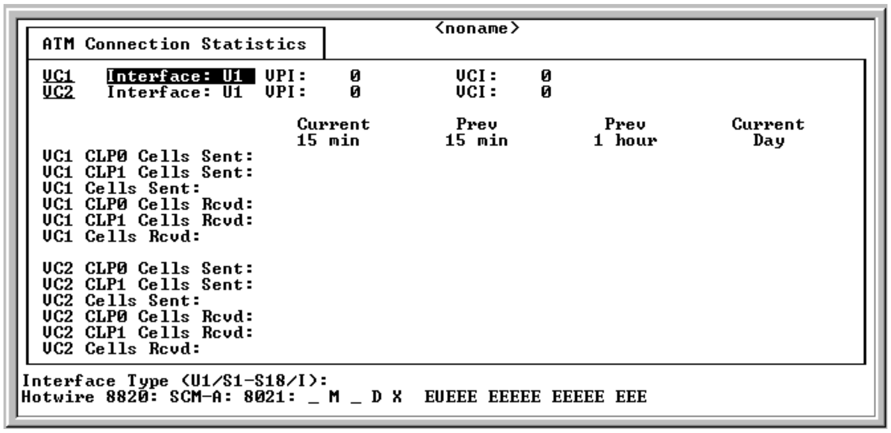
| **Statistics**<br>**Slot (ATM Slot Statistics)** | **B-E-D-C** |
|---|---|
| **Slot #** – Enter the slot number of the port card whose bus interface with the SCM card you wish to monitor. | |
| **CLP0 Cells Sent** – The number of ATM cells with the Cell Loss Priority (CLP) bit set to 0 sent to the port card. CLP0 cells should be discarded last during periods of congestion. | |
| **CLP1 Cells Sent** – The number of ATM cells with the CLP bit set to 1 sent to the port card. CLP1 cells should be discarded first during periods of congestion. | |
| **Cells Sent** – The total number of ATM cells sent to the port card. | |
| **CLP0 Cells Rcvd** – The number of ATM cells with the CLP bit set to 0 received from the port card. | |
| **CLP1 Cells Rcvd** – The number of ATM cells with the CLP bit set to 1 received from the port card. | |
| **Cells Rcvd** – The total number of ATM cells received from the port card. | |

## Displaying ATM Connection Statistics

To display individual ATM statistics associated with one or two VCs connected through the SCM card, follow this menu selection sequence:

*Monitoring→ATM Switch→Statistics→Connection* (**B-E-D-D**)

The ATM Connection Statistics screen appears.



```
 ATM Connection Statistics                        <noname>

 VC1    Interface: U1  VPI:    0         VCI:    0
 VC2    Interface: U1  VPI:    0         VCI:    0

                            Current       Prev          Prev        Current
                            15 min        15 min        1 hour        Day
 VC1 CLP0 Cells Sent:
 VC1 CLP1 Cells Sent:
 VC1 Cells Sent:
 VC1 CLP0 Cells Rcvd:
 VC1 CLP1 Cells Rcvd:
 VC1 Cells Rcvd:

 VC2 CLP0 Cells Sent:
 VC2 CLP1 Cells Sent:
 VC2 Cells Sent:
 VC2 CLP0 Cells Rcvd:
 VC2 CLP1 Cells Rcvd:
 VC2 Cells Rcvd:
Interface Type (U1/S1-S18/I):
Hotwire 8820: SCM-A: 8021: _ M _ D X  EUEEE EEEEE EEEEE EEE
```

### NOTES:

— Historical statistics are only kept for the VCs displayed on this screen, not for all VCs simultaneously. Therefore, when you enter a new VPI/VCI, the historical data will display as zeros.

— Statistics will not be accumulated on data received from the network if the uplink is in any diagnostic loopback.

— All counters are updated every few seconds as the screen is refreshed. You may press Ctrl-r at any time to reset the User interface and SNMP interface statistical counters.

— Statistics are kept for the present 15-minute period, previous 15-minute period, previous 1-hour period, and the current day period. The 1-hour and current day counters are updated every hour on the hour. The current day counter is cleared at midnight. All counters are synchronized to the MCP card's real-time clock.

The ATM Connection Statistics screen displays the information listed in Table 5-28, ATM Connection Statistics Screen.

**Table 5-28. ATM Connection Statistics Screen (1 of 2)**

**Statistics**
**Connection (ATM Connection Statistics) B-E-D-D**

One or two connections' statistics can been monitored (VC1/VC2), which are defined by their Interface/VPI/VCIs. You can view these statistics for uplink between the SCM in/out to the network (U1), between the SCM and a port card (s1–s18), or for inband management on the SAR interface (I).

For uplink statistics:

**Interface Type** – The connection's interface. Enter U1 (for Uplink 1).

**VPI** – The connection's VPI. For U1 interface, enter 0 through 255.

**VCI** – The connection's VCI. For U1 interface, enter 1 through 8191.

**VC*x* CLP0 Cells Sent** – The number of ATM cells with the Cell Loss Priority (CLP) bit set to 0 sent to the Network by the SCM. CLP0 cells should be discarded last during periods of congestion.

**VC*x* CLP1 Cells Sent** – The number of ATM cells with the CLP bit set to 1 sent to the Network by the SCM. CLP1 cells should be discarded first during periods of congestion.

**VC*x* Cells Sent** – The total number of ATM cells sent to the Network by the SCM.

**VC*x* CLP0 Cells Rcvd** – The number of ATM cells with the CLP bit set to 0 received from the Network by the SCM.

**VC*x* CLP1 Cells Rcvd** – The number of ATM cells with the CLP bit set to 1 received from the Network by the SCM.

**VC*x* Cells Rcvd** – The total number of ATM cells received from the Network by the SCM.

For statistics between a port card and the SCM:

**Interface Type** – The connection's interface. Enter S1 through S18 for ATM buses associated with Slots 1 through 18.

**VPI** – The connection's VPI:

- For custom connections on slot interface (s1 through s18), enter 0.
- For custom connections on slot interface (s1 through s18), enter port number.

**VCI** – The connection's VCI:

- For custom connections on slot interface (s1 through s18), enter the VID number of custom connections 2 through 255.
- For standard connections on slot interface (s1 through s18), enter 0.

**VC*x* CLP0 Cells Sent** – Number of ATM cells with the Cell Loss Priority (CLP) bit set to 0 sent to the port card by the SCM. CLP0 cells should be discarded last during periods of congestion.

**VC*x* CLP1 Cells Sent** – Number of ATM cells with the CLP bit set to 1 sent to the port card by the SCM. CLP1 cells should be discarded first during periods of congestion.

**VC*x* Cells Sent** – The total number of ATM cells sent to the port card by the SCM.

**VC*x* CLP0 Cells Rcvd** – The number of ATM cells with the CLP bit set to 0 received from the port card by the SCM.

**VC*x* CLP1 Cells Rcvd** – The number of ATM cells with the CLP bit set to 1 received from the port card by the SCM.

**VC*x* Cells Rcvd** – Total number of ATM cells received from the port card by the SCM.

**Table 5-28. ATM Connection Statistics Screen (2 of 2)**

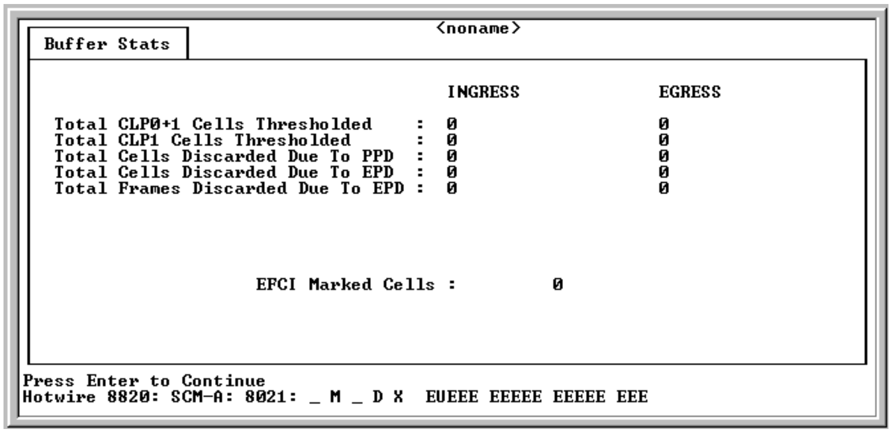
| **Statistics**<br>**Connection (ATM Connection Statistics)** ***(Continued)*** **B-E-D-D** |
|---|
| For inband management statistics:<br>**Interface Type** – The connection's interface. Enter I for the inband management SAR interface.<br>**VPI** – The connection's VPI. For the Inband Management interface, enter 0.<br>**VCI** – The connection's VCI. For the Inband Management interface, enter 32.<br>**VC*x* CLP0 Cells Sent** – Number of ATM cells with the Cell Loss Priority (CLP) bit set to 0 sent to the MCP card by the SCM. CLP0 cells should be discarded last during periods of congestion.<br>**VC*x* CLP1 Cells Sent** – The number of ATM cells with the CLP bit set to 1 sent to the MCP card via the SCM processor. CLP1 cells should be discarded first during periods of congestion.<br>**VC*x* Cells Sent** – The total number of ATM cells sent to the MCP card by the SCM.<br>**VC*x* CLP0 Cells Rcvd** – The number of ATM cells with the CLP bit set to 0 received from the MCP card via the SCM processor.<br>**VC*x* CLP1 Cells Rcvd** – The number of ATM cells with the CLP bit set to 1 received from the MCP card via the SCM processor.<br>**VC*x* Cells Rcvd** – The total number of ATM cells received from the MCP card by the SCM. |

## Displaying Buffer Statistics

To display ATM buffer statistics, follow this menu selection sequence:

*Monitoring→ATM Switch→Statistics→Buffer Stats* (**B-E-D-E**)

The Buffer Stats screen appears.



```
                                     <noname>
 Buffer Stats
                                         INGRESS               EGRESS

  Total CLP0+1 Cells Thresholded    :  0                     0
  Total CLP1 Cells Thresholded      :  0                     0
  Total Cells Discarded Due To PPD  :  0                     0
  Total Cells Discarded Due To EPD  :  0                     0
  Total Frames Discarded Due To EPD :  0                     0



                    EFCI Marked Cells :         0



Press Enter to Continue
Hotwire 8820: SCM-A: 8021: _ M _ D X  EUEEE EEEEE EEEEE EEE
```

The Buffer Stats screen displays the information listed in Table 5-29, Buffer Stats Screen.

**Table 5-29. Buffer Stats Screen**

| **Statistics**<br>**Buffer Stats** | **B-E-D-E** |
|---|---|
| The buffer statistics for both incoming (ingress) and outgoing (egress) cells on the SCM card are displayed on this screen.<br>**Total CLP0+1 Cells Thresholded** – Displays the total number of cells dropped by the SCM's ATM switch due to congestion that are marked either CLP0 or CLP1.<br>**Total CLP1 Cells Thresholded** – Displays the total number of cells dropped by the SCM's ATM switch due to congestion that are marked CLP1.<br>**Total Cells Discarded Due To PPD** – Displays the total number of cells dropped by the SCM's ATM switch due to congestion the Partial Packet Discard (PPD) feature.<br>**Total Cells Discarded Due To EPD** – Displays the total number of cells dropped by the SCM's ATM switch due to congestion the Early Packet Discard (EPD) feature.<br>**Total Frames Discarded Due To EPD** – Displays the total number of frames (packets) dropped by the SCM's ATM switch due to congestion the Early Packet Discard (EPD) feature.<br>**EFCI Marked Cells** – Number of cells marked with Explicit Forward Congestion Indication because of congestion on the SCM card. | |

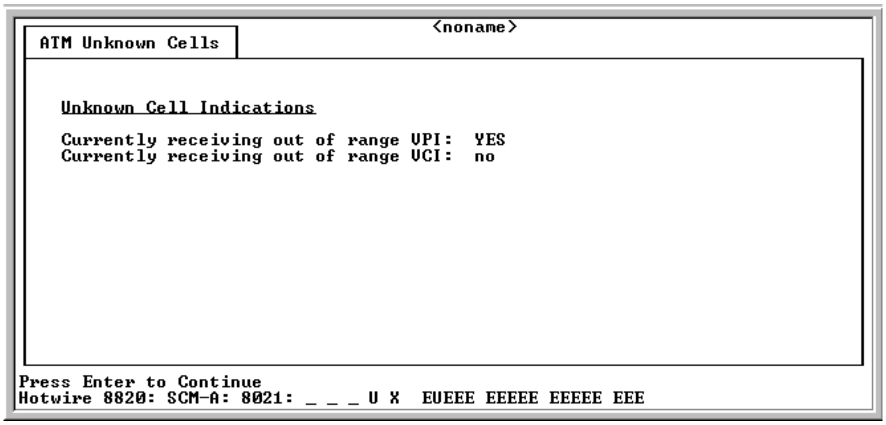
## Displaying Unknown Cells

An unknown cell is a cell received on an interface with a VPI or VCI number that does not match any configured VPI/VCI pair on that interface. If either the VPI or VCI unknown cells indicator continues to show YES, there is probably a misconfiguration between the SCM card and a port card, or between the SCM card and its uplink ATM switch. Check the entries on the Unknown Cells log on the ATM SDSL port card(s). If there are no Unknown Cells entries on any of the ATM SDSL port cards, check the upstream ATM switch.

To display unknown cells activity, follow this menu selection sequence:

*Monitoring→ATM→Unknown Cells* (**B-E-F**)

The ATM Unknown Cells screen appears.



```
                                        <noname>
 ATM Unknown Cells

   Unknown Cell Indications

   Currently receiving out of range VPI:  YES
   Currently receiving out of range VCI:  no

Press Enter to Continue
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The ATM Unknown Cells screen displays the information listed in Table 5-30, ATM Unknown Cells Screen.

**Table 5-30. ATM Unknown Cells Screen**

| **Unknown Cells (ATM Unknown Cells)** | **B-E-F** |
|---|---|
| The Unknown Cells screen provides an indication that the SCM is receiving cells with an unknown VPI/VCI header. The SYSLOG will also capture some of these events.<br>**Currently receiving out of range VPI** – Displays YES or no.<br>**Currently receiving out of range VCI** – Displays YES or no. | |

# Diagnostics Menu Options

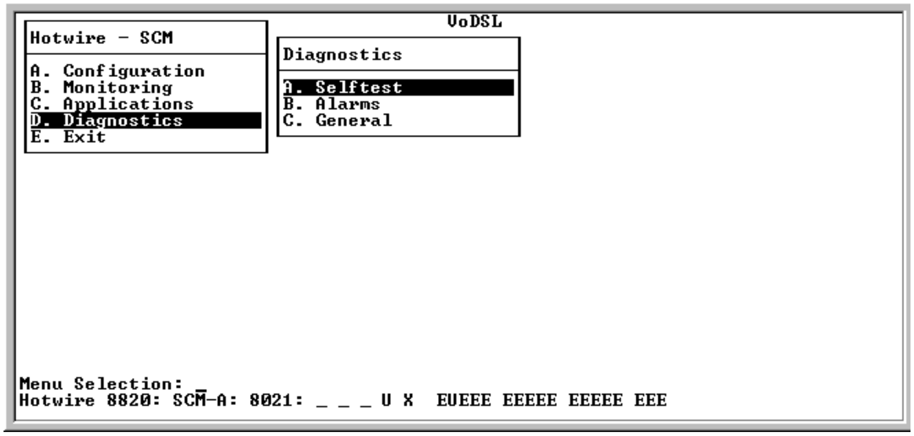
# 6

## Overview

This chapter describes the options on the Diagnostics menu of the SCM card. Use the Diagnostics menu to display selftest results, view alarms or execute loopback tests. To access the Diagnostics menu, follow this menu selection sequence:

*SCM Main Menu → Diagnostics* (**D**)

The Diagnostics menu appears.



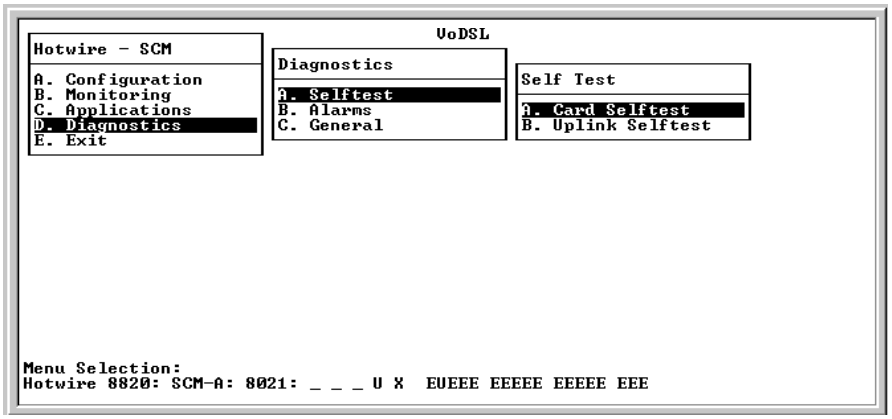
```
 Hotwire - SCM                                VoDSL
                          Diagnostics
 A. Configuration
 B. Monitoring            A. Selftest
 C. Applications          B. Alarms
 D. Diagnostics           C. General
 E. Exit

Menu Selection: _
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

# Selftest

To access the Selftest menu, follow this menu selection sequence:

*SCM Main Menu* → *Diagnostics* → *Selftest* (**D-A**)

The Selftest menu appears.



```
                                   VoDSL
Hotwire - SCM
                      Diagnostics
A. Configuration                              Self Test
B. Monitoring         A. Selftest
C. Applications       B. Alarms               A. Card Selftest
D. Diagnostics        C. General              B. Uplink Selftest
E. Exit

Menu Selection:
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The Selftest menu allows you to display the results of the following selftests:

- Card (**D-A-A**)
- Uplink (**D-A-B**)

The Uplink Selftest screen differs depending on the type of uplink you have.

## Card Selftest

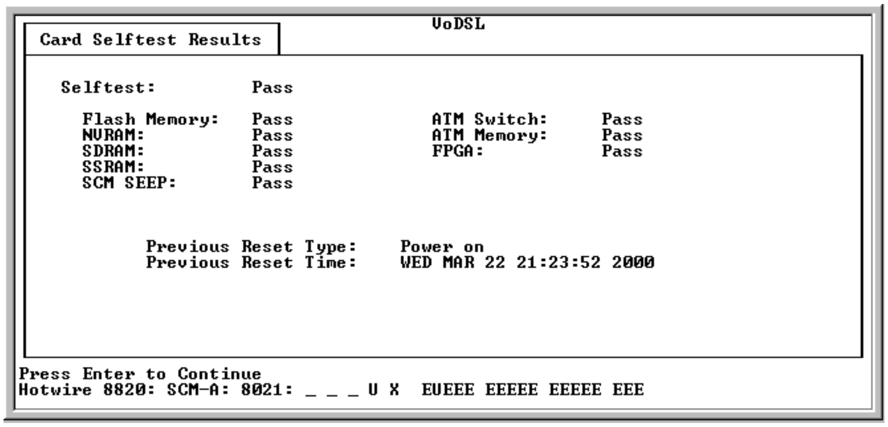
### ▶ Procedure

To view card selftest information:

1. From the Hotwire – SCM menu, follow this menu selection sequence:

   *Diagnostics→Selftest* (**D-A-A**)

   The Card Selftest Results screen appears.



```
 Card Selftest Results          VoDSL

   Selftest:         Pass

     Flash Memory:   Pass             ATM Switch:     Pass
     NVRAM:          Pass             ATM Memory:     Pass
     SDRAM:          Pass             FPGA:           Pass
     SSRAM:          Pass
     SCM SEEP:       Pass


         Previous Reset Type:    Power on
         Previous Reset Time:    WED MAR 22 21:23:52 2000

Press Enter to Continue
Hotwire 8820: SCM-A: 8021: _ _ _ V X  EVEEE EEEEE EEEEE EEE
```

The screen displays the results of the last disruptive selftest of the SCM card. This selftest is only performed on system power-on or a card reset. All subsystems (processors, memory, and interfaces) report pass or fail. If all subsystems pass, the card passes.

In addition, the following information is displayed:

— Previous Reset Type: How the last reset was initiated, either **`Software`** (via software command), **`Power On`** (power turned off, then on), or **`External`** (via MCP command).

— Previous Reset Time: When the last reset occurred.

## Uplink Selftest

### ▶ Procedure

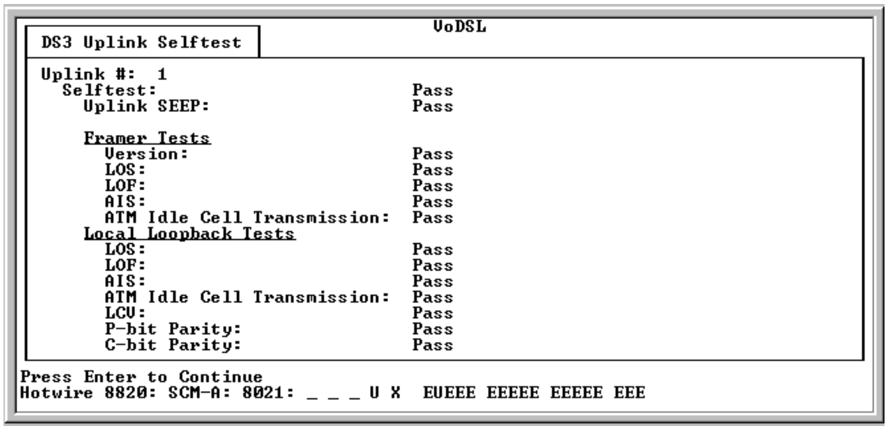
To view uplink selftest information:

1. From the Hotwire – SCM menu, follow this menu selection sequence:

   *Diagnostics*→*Selftest* (**D-A-B**)

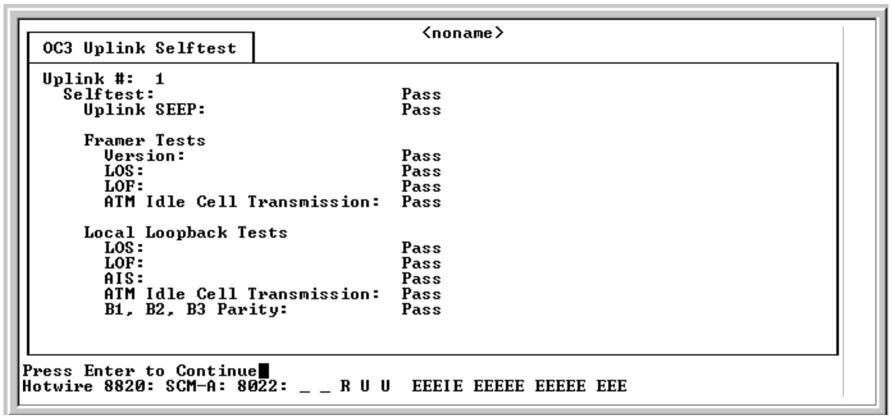
   The appropriate Uplink Selftest screen appears. Some examples follow.

**DS3**



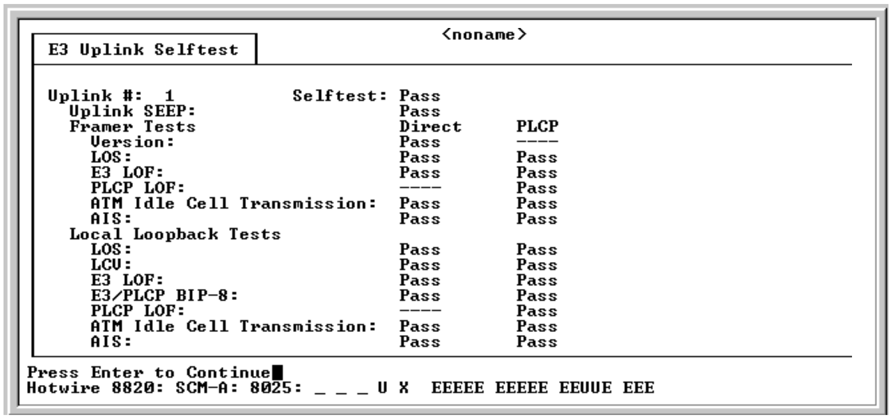
```
DS3 Uplink Selftest                         VoDSL

Uplink #:  1
  Selftest:                            Pass
    Uplink SEEP:                       Pass

    Framer Tests
      Version:                         Pass
      LOS:                             Pass
      LOF:                             Pass
      AIS:                             Pass
      ATM Idle Cell Transmission:      Pass
    Local Loopback Tests
      LOS:                             Pass
      LOF:                             Pass
      AIS:                             Pass
      ATM Idle Cell Transmission:      Pass
      LCV:                             Pass
      P-bit Parity:                    Pass
      C-bit Parity:                    Pass

Press Enter to Continue
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

**OC3**



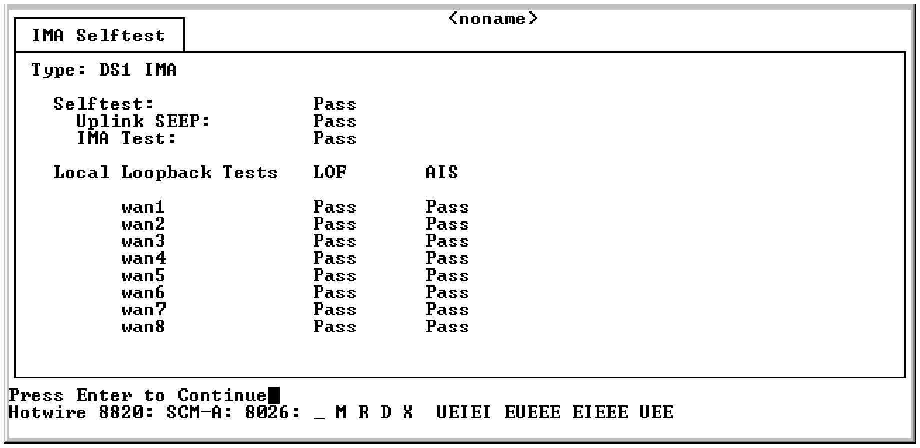
```
OC3 Uplink Selftest                        <noname>

Uplink #:  1
  Selftest:                            Pass
    Uplink SEEP:                       Pass

    Framer Tests
      Version:                         Pass
      LOS:                             Pass
      LOF:                             Pass
      ATM Idle Cell Transmission:      Pass

    Local Loopback Tests
      LOS:                             Pass
      LOF:                             Pass
      AIS:                             Pass
      ATM Idle Cell Transmission:      Pass
      B1, B2, B3 Parity:               Pass

Press Enter to Continue
Hotwire 8820: SCM-A: 8022: _ _ R U U  EEEIE EEEEE EEEEE EEE
```

## E3



```
 E3 Uplink Selftest                 <noname>

  Uplink #:  1          Selftest: Pass
    Uplink SEEP:                  Pass
    Framer Tests                  Direct     PLCP
      Version:                    Pass       ----
      LOS:                        Pass       Pass
      E3 LOF:                     Pass       Pass
      PLCP LOF:                   ----       Pass
      ATM Idle Cell Transmission: Pass       Pass
      AIS:                        Pass       Pass
    Local Loopback Tests
      LOS:                        Pass       Pass
      LCV:                        Pass       Pass
      E3 LOF:                     Pass       Pass
      E3/PLCP BIP-8:              Pass       Pass
      PLCP LOF:                   ----       Pass
      ATM Idle Cell Transmission: Pass       Pass
      AIS:                        Pass       Pass

Press Enter to Continue
Hotwire 8820: SCM-A: 8025: _ _ _ U X  EEEEE EEEEE EEUUE EEE
```

## DS1/E1 IMA



```
 IMA Selftest                          <noname>
 Type: DS1 IMA

   Selftest:            Pass
     Uplink SEEP:       Pass
     IMA Test:          Pass

   Local Loopback Tests   LOF       AIS

         wan1             Pass      Pass
         wan2             Pass      Pass
         wan3             Pass      Pass
         wan4             Pass      Pass
         wan5             Pass      Pass
         wan6             Pass      Pass
         wan7             Pass      Pass
         wan8             Pass      Pass

Press Enter to Continue
Hotwire 8820: SCM-A: 8026: _ M R D X  UEIEI EUEEE EIEEE UEE
```

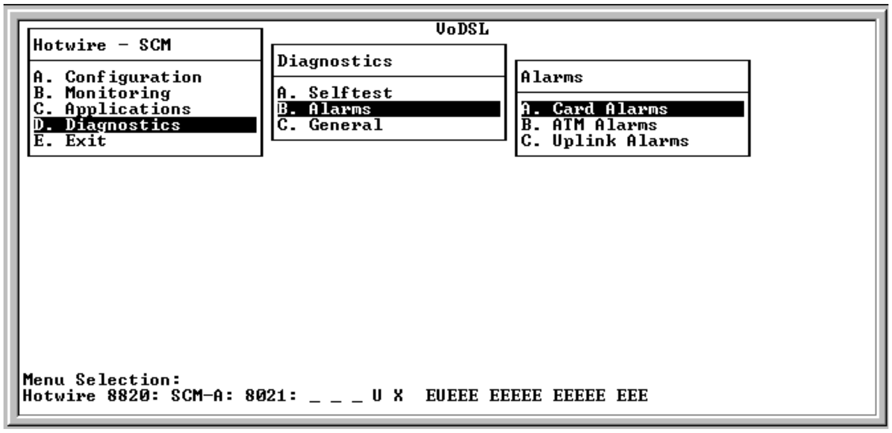
The screen displays the results of the last disruptive selftest of the SCM uplink childcard.

# Alarms

To access the Alarms menu, follow this menu selection sequence:

*SCM Main Menu → Diagnostics → Alarms* (**D-B**)

The Alarms menu appears.



```
Menu Selection:
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The Alarms menu allows you to display the results of the following alarms:

- Card (**D-B-A**)
- ATM (**D-B-B**)
- Uplink (**D-B-C**)

## Card Alarms

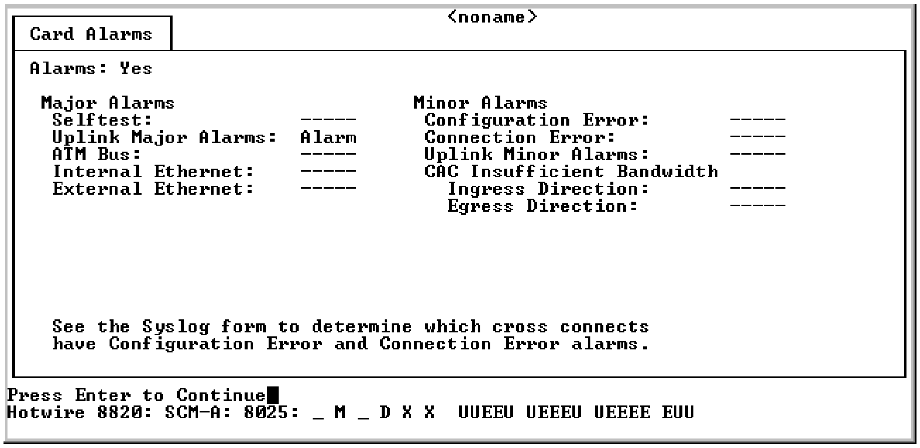
### ▶ Procedure

To view Card Alarm information:

1. From the Hotwire – SCM menu, follow this menu selection sequence:

   *Diagnostics → Alarms → Card Alarms* (**D-B-A**)

   The Card Alarms screen appears.



```
                                       <noname>
  Card Alarms

  Alarms: Yes

   Major Alarms                     Minor Alarms
    Selftest:             -----      Configuration Error:       -----
    Uplink Major Alarms:  Alarm      Connection Error:          -----
    ATM Bus:              -----      Uplink Minor Alarms:       -----
    Internal Ethernet:    -----      CAC Insufficient Bandwidth
    External Ethernet:    -----        Ingress Direction:       -----
                                       Egress Direction:        -----





    See the Syslog form to determine which cross connects
    have Configuration Error and Connection Error alarms.

Press Enter to Continue█
Hotwire 8820: SCM-A: 8025: _ M _ D X X  UUEEU UEEEU UEEEE EUU
```

The screen displays all active card alarm conditions. Major alarms include Selftest failure, Uplink alarms, ATM Bus alarms, and Internal Ethernet failure. Minor alarms include Config Error (configuration has been corrupted), Cross Connect Table error, and Uplink Minor Alarms.

To determine which bus has an alarm, see the ATM Alarms screen (**D-B-B**) in *ATM Alarms* on page 6-8. To view uplink alarms, see the Uplink Alarms screen (**D-B-C**) in *Uplink Alarms* on page 6-9.

If the Config Error or Connection Error field indicates that an alarm is present, you can get further details using the Syslog screen (**B-A-C**). Each slot with a Config Error will be listed in the Syslog buffer with information specifying the first cross connection with a Config Error. Each slot with a Connection Error will be listed in the Syslog buffer with information specifying the first cross connection with a Connection Error. For example, if there are 7 Config Errors (2 in Slot 6, and 5 in Slot 9) and 5 Connection Errors (2 in Slot 4, and 3 in Slot 6), the syslog displays:

```
- ConnErr: slot 4 port a VID b VPI c VCI d
- ConnErr: slot 6 port e VID f VPI g VCI h
- CfgErr: slot 6 port i VID j VPI k VCI l
- CfgErr: slot 9 port m VID n VPI o VCI p
- Total of 7 configuration errors 5 connection errors
```

Other cross connections with alarms can be found on the ATM Cross Connect screens (**A-E-B**).

## ATM Alarms

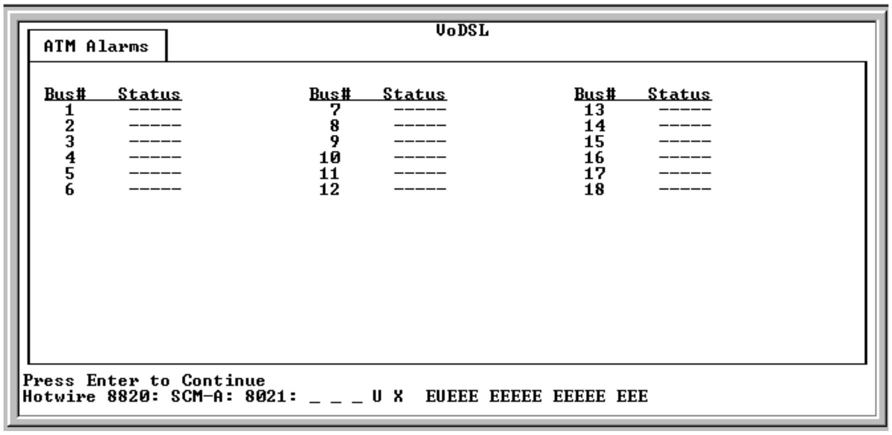
### ▶ Procedure

To view ATM Alarm information:

1. From the Hotwire – SCM menu, follow this menu selection sequence:

   *Diagnostics→Alarms →ATM Alarms* (**D-B-B**)

   The ATM Alarms screen appears.



```
                                          VoDSL
 ATM Alarms

  Bus#   Status              Bus#   Status              Bus#   Status
   1      -----                7     -----               13     -----
   2      -----                8     -----               14     -----
   3      -----                9     -----               15     -----
   4      -----               10     -----               16     -----
   5      -----               11     -----               17     -----
   6      -----               12     -----               18     -----

Press Enter to Continue
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

The screen displays all active ATM Bus alarm conditions.

- **Bus #** – Corresponds to the slot number of the port card connected to the ATM backplane bus.
- **Status** – Displays `Alarm` if the ATM backplane bus is in an alarm state, otherwise displays dashes.

## Uplink Alarms

The Uplink Alarms screen differs depending on the type of uplink you have (DS3, OC3, E3, or IMA).

### ▶ Procedure

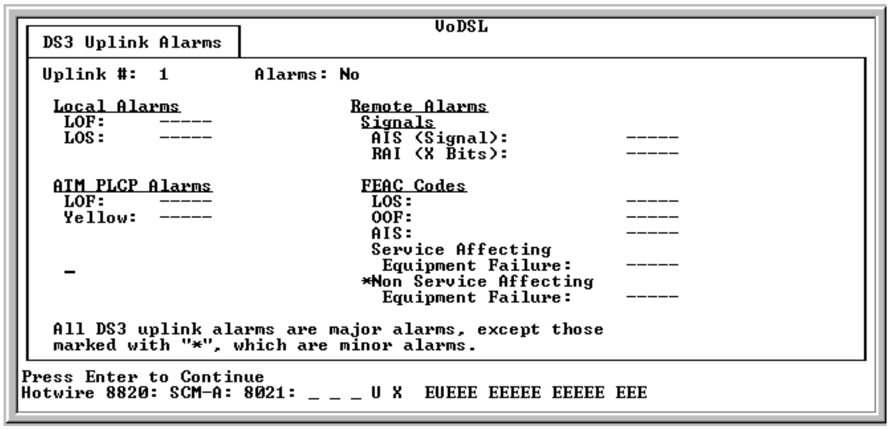
To view Uplink Alarm information:

1. From the Hotwire – SCM menu, follow this menu selection sequence:

   *Diagnostics→Alarms →Uplink Alarms* (**D-B-C**)

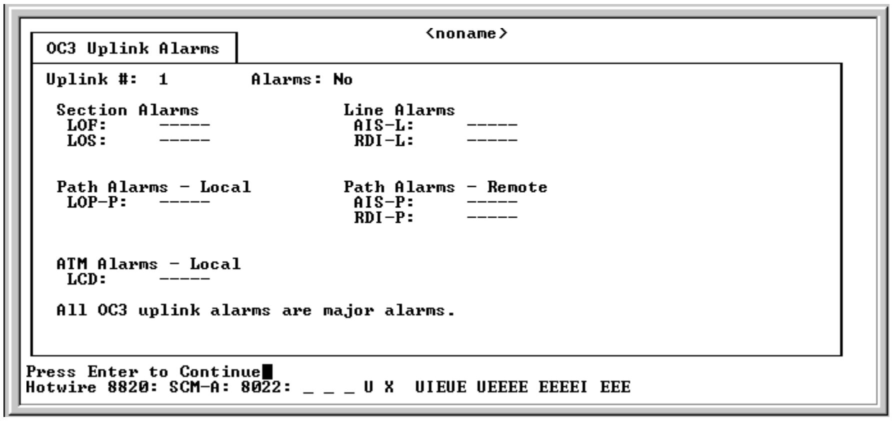
   The appropriate Uplink Alarms screen appears. Some examples follow.

**DS3 – PLCP Mode**



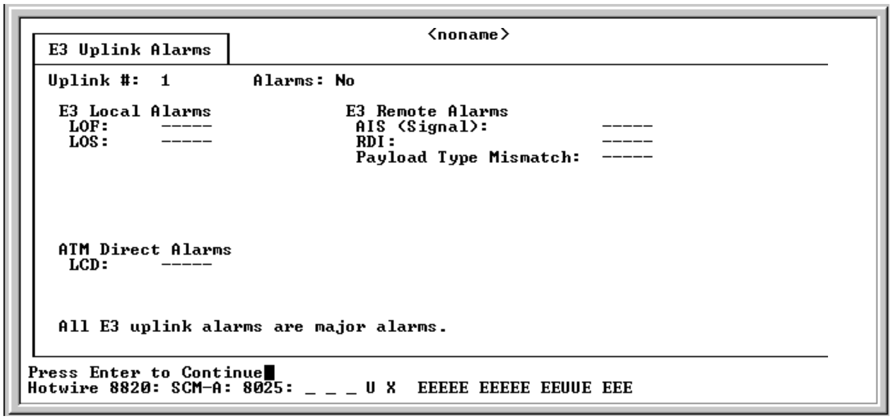
```
 DS3 Uplink Alarms                      VoDSL

 Uplink #:  1        Alarms: No

  Local Alarms                 Remote Alarms
   LOF:     -----               Signals
   LOS:     -----                AIS (Signal):           -----
                                 RAI (X Bits):           -----

  ATM PLCP Alarms               FEAC Codes
   LOF:     -----                LOS:                    -----
   Yellow:  -----                OOF:                    -----
                                 AIS:                    -----
                                 Service Affecting
   _                              Equipment Failure:     -----
                                *Non Service Affecting
                                  Equipment Failure:     -----

  All DS3 uplink alarms are major alarms, except those
  marked with "*", which are minor alarms.
Press Enter to Continue
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

**OC3**



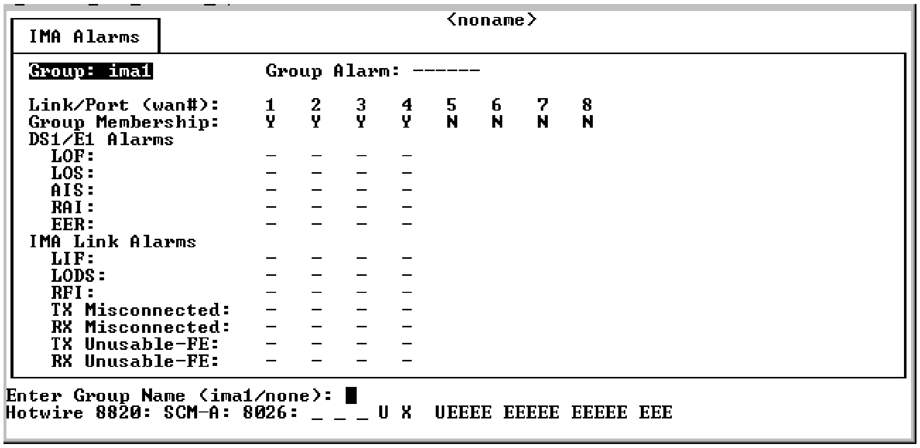
```
 OC3 Uplink Alarms                     <noname>

 Uplink #:  1        Alarms: No

  Section Alarms               Line Alarms
   LOF:     -----               AIS-L:     -----
   LOS:     -----               RDI-L:     -----


  Path Alarms - Local          Path Alarms - Remote
   LOP-P:   -----               AIS-P:     -----
                                RDI-P:     -----


  ATM Alarms - Local
   LCD:     -----

  All OC3 uplink alarms are major alarms.


Press Enter to Continue█
Hotwire 8820: SCM-A: 8022: _ _ _ U X  UIEUE UEEEE EEEEI EEE
```

### E3 – Direct Mode



```
                                      <noname>
 E3 Uplink Alarms
 Uplink #:  1        Alarms: No

  E3 Local Alarms              E3 Remote Alarms
   LOF:     -----               AIS (Signal):            -----
   LOS:     -----               RDI:                     -----
                                Payload Type Mismatch:   -----




  ATM Direct Alarms
   LCD:     -----



  All E3 uplink alarms are major alarms.

Press Enter to Continue█
Hotwire 8820: SCM-A: 8025: _ _ _ U X  EEEEE EEEEE EEUUE EEE
```

### IMA



```
                                         <noname>
 IMA Alarms

 Group: ima1           Group Alarm: ------

 Link/Port (wan#):     1   2   3   4   5   6   7   8
 Group Membership:     Y   Y   Y   Y   N   N   N   N
 DS1/E1 Alarms
   LOF:                -   -   -   -
   LOS:                -   -   -   -
   AIS:                -   -   -   -
   RAI:                -   -   -   -
   EER:                -   -   -   -
 IMA Link Alarms
   LIF:                -   -   -   -
   LODS:               -   -   -   -
   RFI:                -   -   -   -
   TX Misconnected:    -   -   -   -
   RX Misconnected:    -   -   -   -
   TX Unusable-FE:     -   -   -   -
   RX Unusable-FE:     -   -   -   -

Enter Group Name (ima1/none): █
Hotwire 8820: SCM-A: 8026: _ _ _ U X  UEEEE EEEEE EEEEE EEE
```

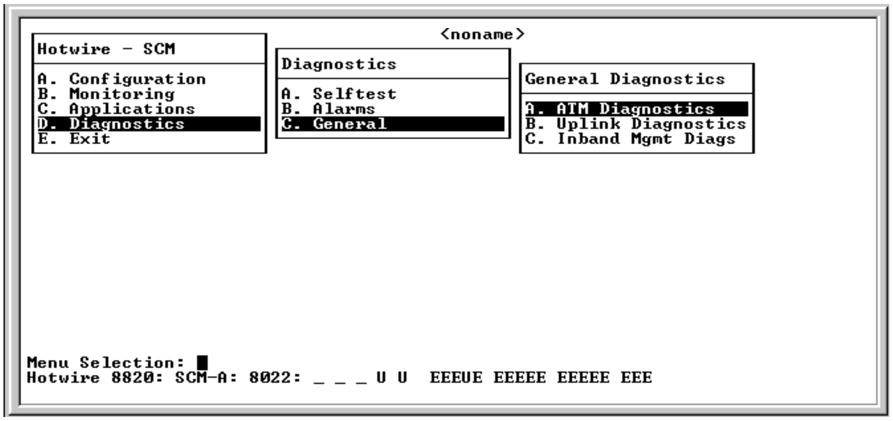
2. For the IMA uplink, enter ima1 or none in the Group field. If none is selected, the IMA Link Alarms fields do not appear.

# General Diagnostics

To access the General Diagnostics menu, follow this menu selection sequence:

*SCM Main Menu* → *Diagnostics* → *General* (**D-C**)

The General Diagnostics menu appears.



```
                                      <noname>
Hotwire - SCM
                       Diagnostics
A. Configuration                              General Diagnostics
B. Monitoring          A. Selftest
C. Applications        B. Alarms              A. ATM Diagnostics
D. Diagnostics         C. General             B. Uplink Diagnostics
E. Exit                                       C. Inband Mgmt Diags



Menu Selection:
Hotwire 8820: SCM-A: 8022: _ _ _ U U  EEEUE EEEEE EEEEE EEE
```

The General Diagnostics menu allows you to display the following diagnostic screens:

- ATM Diagnostics (**D-C-A**). Allows you to display the ATM Ping screen (**D-C-A-A**).
- Uplink Diagnostics (**D-C-B**).
- Inband Mgmt Diags (**D-C-C**). Currently not supported.

## ATM Ping

Use the ATM Ping screen to verify that the virtual circuit is connected. The card sends cells to the remote end of the virtual channel connection (the endpoint or ATM network), which returns them. The estimated round trip time is then displayed. The screen is refreshed every 15 seconds.

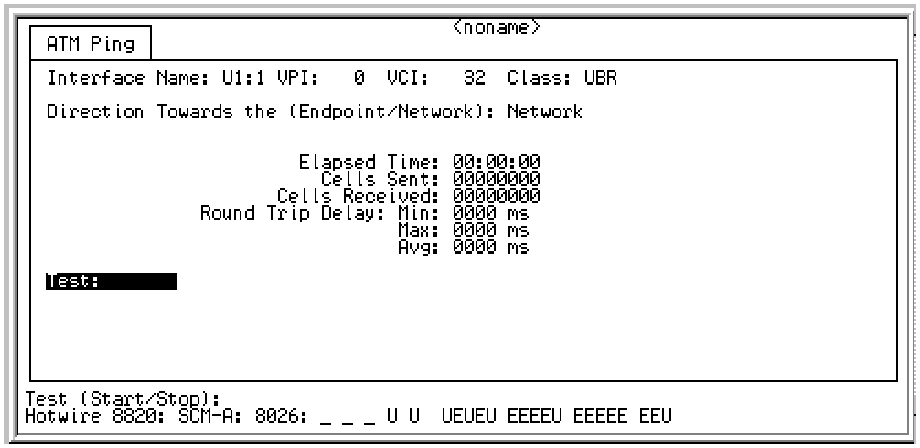
### ▶ Procedure

To test a virtual circuit:

1. From the Hotwire – SCM menu, follow this menu selection sequence:

   *Diagnostics→General Diagnostics →ATM Diagnostics→ATM Ping* (**D-C-A-A**)

   The ATM Ping screen appears for the uplink (U1 interface).



```
                                         <noname>
 ATM Ping
 Interface Name: U1:1 VPI:   0  VCI:   32  Class: UBR

 Direction Towards the (Endpoint/Network): Network


                      Elapsed Time: 00:00:00
                        Cells Sent: 00000000
                    Cells Received: 00000000
          Round Trip Delay: Min: 0000 ms
                             Max: 0000 ms
                             Avg: 0000 ms

 Test:



Test (Start/Stop):
Hotwire 8820: SCM-A: 8026: _ _ _ U U  UEUEU EEEEU EEEEE EEU
```

2. Select Start. ATM Ping statistics appear on the screen.
3. Interpret the display as shown in Table 6-1, Monitoring – ATM Ping.
4. Select Stop to stop the Ping test.

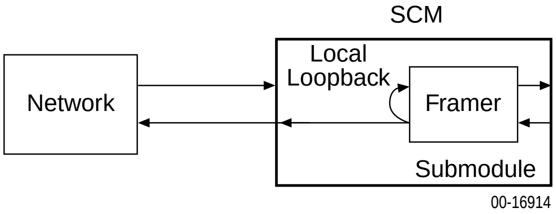
**Table 6-1. Monitoring – ATM Ping**

| **ATM Ping Screen** | **D-C-A-A** |
|---|---|
| Displays the progressive results of sending of test cells to the ATM endpoint on a selected virtual circuit.<br>**Interface Name** – Selects the uplink (U1) interface to be tested.<br>**VPI** – Displays the VPI number of the inband management VC as defined on the Inband Management screen (**A-C-A**).<br>**VCI** – Displays the VCI number of the inband management VC as defined on the Inband Management screen (**A-C-A**).<br>**Class** – Displays the class of service for this VPI/VCI.<br>**Direction** – Specifies that the loopback cell for the VPI/VCI is defined towards the network.<br>**Elapsed Time** – Displays the amount of time that has elapsed since the test began.<br>**Cells Sent** – Displays the number of test cells sent. This is a 64-bit counter that stops when the limit is reached.<br>**Cells Received** – Displays the number of test cells received. This is a 64-bit counter that stops when the limit is reached.<br>**Round Trip Delay:**<br>**Min** – Displays the shortest round trip delay (0 to 99999 ms) encountered on cells received. Dropped cells are not counted.<br>**Max** – Displays the longest round trip delay (0 to 99999 ms) encountered on cells received. Dropped cells are not counted.<br>**Avg** – Displays the average round trip delay (0 to 99999 ms) encountered on cells received. Dropped cells are not counted.<br>**Test** – Enter start or stop to begin or end the test. Once started, the test remains in effect until you stop it. | |

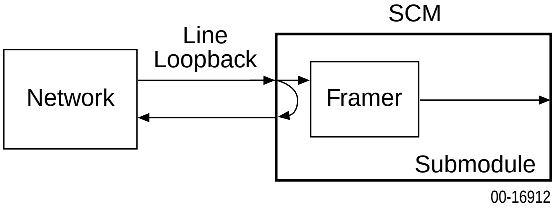
## Uplink Diagnostics

Uplink Diagnostics allows you to run local, line and payload loopbacks on the DS3, OC3, or E3 uplink. The Uplink Diagnostics screen differs depending on the type of uplink you have (DS3, OC3, or E3). For DS3 uplinks, you can initiate both near- and far-end loopbacks. For OC3, E3, and IMA uplinks, you can initiate near-end loopbacks. Any test in progress can be stopped via the user interface screen or SNMP management, regardless of who requested it.

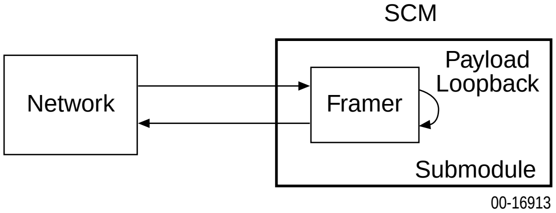
The Local Loopback loops the transmit signal after it has passed through the framing circuitry.



The Line Loopback loops the received signal on the network interface back to the network before reaching the framing circuitry without change.



The Payload Loopback loops the received signal on the network interface back to the network after it has passed through the framing circuitry.



Observe the following rules for loopback tests:

- Far-end initiated loopback requests are ignored if a near-end initiated loopback test is in progress.
- You must stop any loopback or pattern tests currently in progress before initiating another loopback or pattern test.

### ▶ Procedure

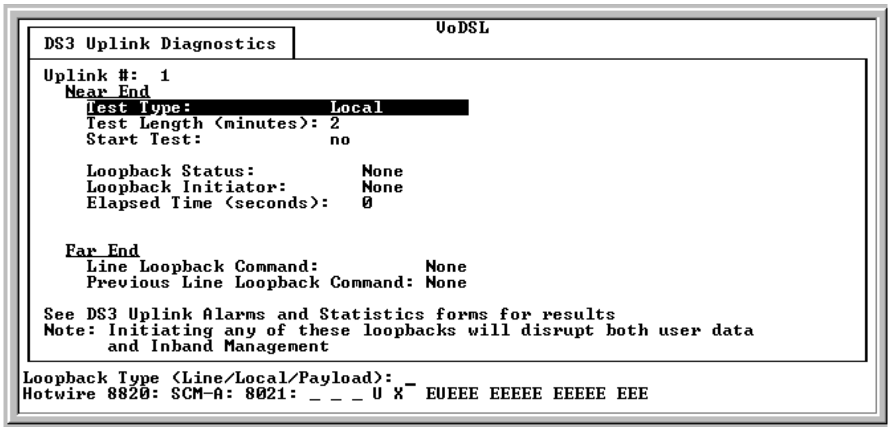
To view Uplink Diagnostics information:

1. From the Hotwire – SCM menu, follow this menu selection sequence:

   *Diagnostics→General Diagnostics →Uplink Diagnostics* (**D-C-B**)

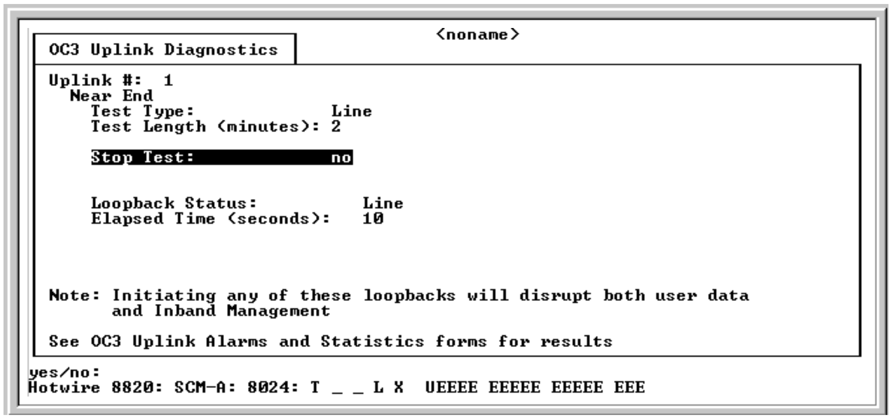
   Either the DS3, OC3, or E3 Uplink Diagnostics screen appears.

**DS3**



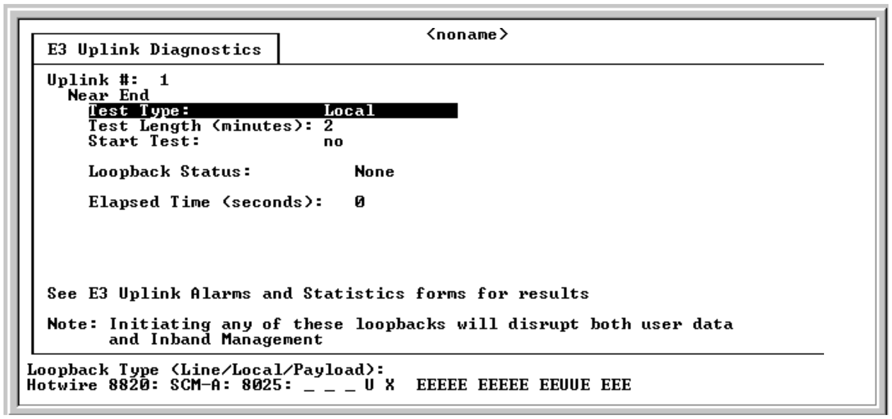
```
                                           VoDSL
 DS3 Uplink Diagnostics

 Uplink #:  1
   Near End
     Test Type:                 Local
     Test Length (minutes): 2
     Start Test:                no

     Loopback Status:              None
     Loopback Initiator:           None
     Elapsed Time (seconds):       0


   Far End
     Line Loopback Command:              None
     Previous Line Loopback Command: None

 See DS3 Uplink Alarms and Statistics forms for results
 Note: Initiating any of these loopbacks will disrupt both user data
         and Inband Management
Loopback Type (Line/Local/Payload): _
Hotwire 8820: SCM-A: 8021: _ _ _ U X  EUEEE EEEEE EEEEE EEE
```

### OC3



```
                                          <noname>
 OC3 Uplink Diagnostics

 Uplink #:  1
   Near End
     Test Type:               Line
     Test Length (minutes): 2

     Stop Test:               no


     Loopback Status:            Line
     Elapsed Time (seconds):     10



 Note: Initiating any of these loopbacks will disrupt both user data
       and Inband Management

 See OC3 Uplink Alarms and Statistics forms for results
yes/no:
Hotwire 8820: SCM-A: 8024: T _ _ L X  UEEEE EEEEE EEEEE EEE
```

### E3



```
                                         <noname>
 E3 Uplink Diagnostics

 Uplink #:  1
   Near End
     Test Type:               Local
     Test Length (minutes): 2
     Start Test:              no

     Loopback Status:            None

     Elapsed Time (seconds):     0




 See E3 Uplink Alarms and Statistics forms for results

 Note: Initiating any of these loopbacks will disrupt both user data
       and Inband Management
Loopback Type (Line/Local/Payload):
Hotwire 8820: SCM-A: 8025: _ _ _ U X  EEEEE EEEEE EEUUE EEE
```

2. Type **Local**, **Line**, or **Payload** in the Test Type field to initiate a Near End Loopback.
3. Select the length of the loopback test in minutes, either 2, 15, 30, or 60 (Default = 2). The Elapsed Time field reflects the number of minutes that the loopback test has been active.
4. Type **Y** in the Start Test field to initiate or restart a Near End Loopback test. This information is reflected in the Loopback Status field.

   You can type **Y** in the Stop Test field to stop a test already in progress if you do not want to wait until the specified time has elapsed. The cursor then moves back to the Test Type field and you can start a new test.

   The New Test field appears if you allow the test to run until the specified time has elapsed. Type **Y** in the New Test field to initiate a new test type once a test has been terminated. Typing Y in this field displays the Start Test field.
5. For DS3 uplinks, enter **Start** in the Line Loopback Command field to place the far-end device in a loopback. Or enter **Stop** to remove the far-end device from a loopback. The start or stop sequence will be sent only once to the far-end device per activation of this field. After the command sequence is sent, this field displays **`None`**.

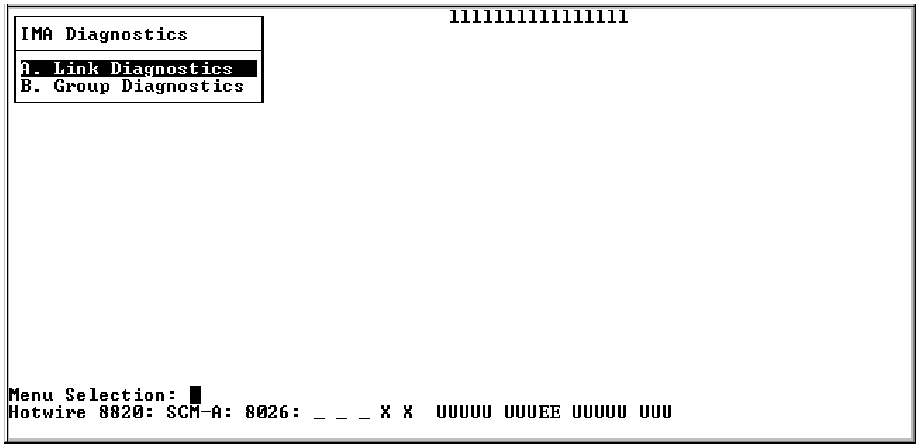
   The Previous Line Loopback Command field displays the last loopback command sent to the far end (Start or Stop). If no command has been sent, this field displays **`None`**.

## IMA Diagnostics

To access the IMA Diagnostics menu, follow this menu selection sequence:

*SCM Main Menu → Diagnostics → General → Uplink* (**D-C-B**)

The IMA Diagnostics menu appears.



```
                                         1111111111111111
 IMA Diagnostics

 A. Link Diagnostics
 B. Group Diagnostics










Menu Selection: █
Hotwire 8820: SCM-A: 8026: _ _ _ X X  UUUUU UUUEE UUUUU UUU
```

The IMA Diagnostics menu allows you to display the following diagnostic screens:

- Link Diagnostics (**D-C-B-A**).
- Group Diagnostics (**D-C-B-B**).

## IMA Uplink Diagnostics – Link/Port

IMA Uplink Diagnostics allows you to run local, line, and payload loopbacks on the IMA uplink link/port. Line Loopback and Payload Loopback should be used in conjunction with test equipment that can terminate the far-end physical link interface and that is capable of generating and receiving a test pattern. These loopback tests can aid you while installing the physical link before you activate IMA functionality. Local Loopback is not currently recommended for use on an SCM card with the IMA uplink.

### NOTE:

Payload loopback is not supported for the 8027 and 8028 E1 IMA uplinks. Far-end loopback is not supported for IMA uplinks.

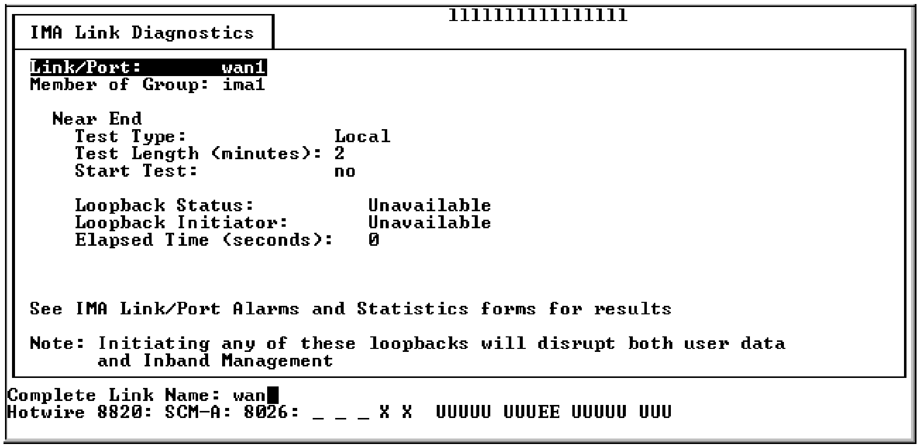
### ▶ Procedure

To view IMA Uplink Diagnostics for the link/port:

1. From the Hotwire – SCM menu, follow this menu selection sequence:

   *Diagnostics→General Diagnostics →Uplink Diagnostics →Link/Port* (**D-C-B-A**)

   The IMA Link Diagnostics screen appears.



```
                                           1111111111111111
 IMA Link Diagnostics

 Link/Port:        wan1
 Member of Group: ima1

   Near End
     Test Type:              Local
     Test Length (minutes): 2
     Start Test:             no

     Loopback Status:           Unavailable
     Loopback Initiator:        Unavailable
     Elapsed Time (seconds):    0


 See IMA Link/Port Alarms and Statistics forms for results

 Note: Initiating any of these loopbacks will disrupt both user data
       and Inband Management
Complete Link Name: wan█
Hotwire 8820: SCM-A: 8026: _ _ _ X X  UUUUU UUUEE UUUUU UUU
```

2. Type the desired link/port in the Link/Port field.
3. Type **Local**, **Line**, or **Payload** in the Test Type field to initiate a Near End Loopback.
4. Select the length of the loopback test in minutes, either 2, 15, 30, or 60 (Default = 2). The Elapsed Time field reflects the number of minutes that the loopback test has been active.
5. Type **Y** in the Start Test field to initiate or restart a Near End Loopback test. This information is reflected in the Loopback Status field.

You can type **Y** in the Stop Test field to stop a test already in progress if you do not want to wait until the specified time has elapsed. The cursor then moves back to the Test Type field and you can start a new test.

6. See Monitor Physical Link/Port Statistics (B-B-B-A) and IMA Group/Link Alarms (D-B-C) screens for test results. View the following fields on this loopback screen for further information:
   - Loopback Status = present state of the loopback.
   - Loopback Initiator = test originator (either near-end or far-end).
   - Elapsed Time = number of seconds that the near-end loopback has been active.

## IMA Uplink Diagnostics – Group

IMA Group Diagnostics allows you to run an IMA test pattern to verify the connectivity of a link/port within an IMA group.

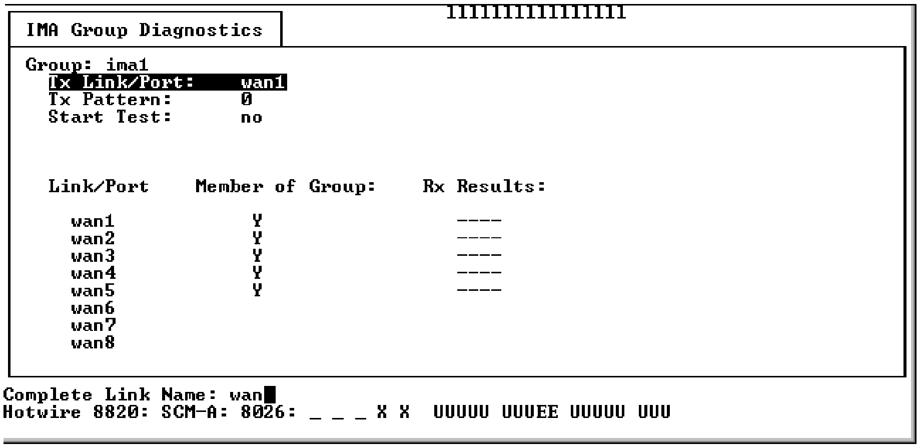
### ▶ Procedure

To view IMA Group Diagnostics:

1. From the Hotwire – SCM menu, follow this menu selection sequence:

   *Diagnostics→General Diagnostics →Uplink Diagnostics →IMA Group* (**D-C-B-B**)

   The IMA Group Diagnostics screen appears.



```
                                        IIIIIIIIIIIIIIII
 IMA Group Diagnostics
 Group: ima1
   Tx Link/Port:     wan1
   Tx Pattern:       0
   Start Test:       no


   Link/Port    Member of Group:    Rx Results:

     wan1           Y                  ----
     wan2           Y                  ----
     wan3           Y                  ----
     wan4           Y                  ----
     wan5           Y                  ----
     wan6
     wan7
     wan8

Complete Link Name: wan█
Hotwire 8820: SCM-A: 8026: _ _ _ X X  UUUUU UUUEE UUUUU UUU
```

2. Type the link/port for the test pattern to be transmitted on in the Tx Link/Port field, if desired. Only links currently a member of the IMA group are allowed (press Ctrl-v for a list).

3. Type the test pattern to send in the Tx Pattern field, if desired. Enter 0 – 254 (Default = 254). This field is optional.

4. Type **Y** in the Start Test field to initiate an IMA Group test.

   You can type **Y** in the Stop Test field to stop a test already in progress if you do not want to wait until the test completes.

5. View the test results at the bottom of this screen:

   — Link/Port (wan #) = Identifies the wan links supported on the card.

   — Member of Group = Indicates whether the link is currently a member of the IMA group (Y) or not (blank).

   — Rx Results = Test result of reach link/port: pass (test pattern received on link), fail (test pattern not received on link), or blank (link/port not member of IMA group).

6. Type **Y** in the Stop Test field to take the IMA group out of test mode and clear test results.

# Troubleshooting

# A

The following procedure can be used when traffic does not seem to be flowing in a Hotwire GranDSLAM/ATM port card configuration. This procedure assumes that the cross-connect tables were verified on the port card and the SCM card, and that the WAN physical parameter options have been verified at both ends.

### ▶ Procedure

To capture data:

1. On the DSL port card, check the DSL Receive statistics.
2. On the DSL port card, check the Transmit statistics associated with wan1 VC.
3. On the DSL port card, check the Unknown Cells log.
4. On the DSL port card, capture the SYSLOG.
5. On the SCM card, check the received statistics on the associated cell bus VC (**B-B-D**).
6. On the SCM card, check the transmit statistics on the associated uplink VC (**B-B-B**).
7. On the upstream DSL Router, validate the received statistics on the WAN interface connected to the Hotwire GranDSLAM chassis.
8. If pinging the upstream DSL Router, validate the IP statistics.
9. On the upstream DSL Router, validate the transmit statistics on the WAN interface connected to the Hotwire GranDSLAM chassis.
10. On the upstream DSL Router, perform other checks as necessary.
11. On the SCM card, check the received statistics on the associated uplink VC (**B-B-B**).
12. On the SCM card, check the transmit statistics on the associated cell bus VC (**B-B-D**).
13. On the SCM card, check alarms (**D-B**).
14. On the SCM card, check the unknown cell indication (**B-E-F**).
15. On the SCM card, capture the SYSLOG (**B-A-C**).
16. On the DSL port card, check received statistics on the associated wan1 VC.

17. On the DSL port card, check the DSL transmit statistics.
18. To determine if the inband mystery cells were coming from the uplink even when not pinging, and are still coming from the uplink when the system started working correctly, try the following:
    - Attach the sniffer to the diagnose type of mystery cells. Are they OAM cells? Are they Bridge PDUs?
    - Direct the VC carrying mystery cells toward an 8344 SDSL port card. It will report if they are Bridge PDUs.
    - Try looping the CISCO interface back toward the SCM card. Do the statistics behave as expected?

# Port Mapping Table

# B

Table B-1, Port Card and SCM Mapping for Chassis Slots 1–9, shows the VPI/VCI default values assigned to circuits on the port card and the SCM for user data (UBR) and user voice (rt-VBR) service.

The table lists all 24 possible ports. The actual number of ports depends on the port card used.

**NOTE:**

Port card data VPI/VCI is always 0,35. Voice VPI/VCI is always 0,40.

**Table B-1. Port Card and SCM Mapping for Chassis Slots 1–9 (1 of 2)**

| Ports | VC Type | Chassis Slot Number | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 | Data | 0,32 | 0,56 | 0,80 | 0,104 | 0,128 | 0,152 | 0,176 | 0,200 | 0,224 |
| | Voice | 1,32 | 1,56 | 1,80 | 1,104 | 1,128 | 1,152 | 1,176 | 1,200 | 1,224 |
| 2 | Data | 0,33 | 0,57 | 0,81 | 0,105 | 0,129 | 0,153 | 0,177 | 0,201 | 0,225 |
| | Voice | 1,33 | 1,57 | 0,40 | 1,105 | 1,129 | 1,153 | 1,177 | 1,201 | 1,225 |
| 3 | Data | 0,34 | 0,58 | 0,82 | 0,106 | 0,132 | 0,154 | 0,178 | 0,202 | 0,226 |
| | Voice | 1,34 | 1,58 | 1,82 | 1,106 | 1,132 | 1,154 | 1,178 | 1,202 | 1,226 |
| 4 | Data | 0,35 | 0,59 | 0,83 | 0,107 | 0,131 | 0,155 | 0,179 | 0,203 | 0,227 |
| | Voice | 1,35 | 1,59 | 1,93 | 1,107 | 1,131 | 1,155 | 1,179 | 1,203 | 1,227 |
| 5 | Data | 0,36 | 0,60 | 0,84 | 0,108 | 0,132 | 0,156 | 0,180 | 0,204 | 0,228 |
| | Voice | 1,36 | 1,60 | 1,84 | 1,108 | 1,132 | 1,156 | 1,180 | 1,204 | 1,228 |
| 6 | Data | 0,37 | 0,61 | 0,85 | 0,109 | 0,133 | 0,157 | 0,181 | 0,205 | 0,229 |
| | Voice | 1,37 | 1,61 | 1,85 | 1,109 | 1,133 | 1,157 | 1,181 | 1,205 | 1,229 |
| 7 | Data | 0,38 | 0,62 | 0,86 | 0,110 | 0,134 | 0,158 | 0,182 | 0,206 | 0,230 |
| | Voice | 1,38 | 1,62 | 1,86 | 1,110 | 1,134 | 1,158 | 1,182 | 1,206 | 1,230 |
| 8 | Data | 0,39 | 0,63 | 0,87 | 0,111 | 0,135 | 0,159 | 0,183 | 0,207 | 0,231 |
| | Voice | 1,39 | 1,63 | 1,87 | 1,111 | 1,135 | 1,159 | 1,183 | 1,207 | 1,231 |
| 9 | Data | 0,40 | 0,64 | 0,88 | 0,112 | 0,136 | 0,160 | 0,184 | 0,208 | 0,232 |
| | Voice | 1,40 | 1,64 | 1,88 | 1,112 | 1,136 | 1,160 | 1,184 | 1,208 | 1,232 |
| 10 | Data | 0,41 | 0,65 | 0,89 | 0,113 | 0,137 | 0,161 | 0,185 | 0,209 | 0,233 |
| | Voice | 1,41 | 1,65 | 1,89 | 1,113 | 1,137 | 1,161 | 1,185 | 1,209 | 1,233 |
| 11 | Data | 0,42 | 0,66 | 0,90 | 0,114 | 0,138 | 0,162 | 0,186 | 0,210 | 0,234 |
| | Voice | 1,42 | 1,66 | 1,90 | 1,114 | 1,138 | 1,162 | 1,186 | 1,210 | 1,234 |
| 12 | Data | 0,43 | 0,67 | 0,91 | 0,115 | 0,139 | 0,163 | 0,187 | 0,211 | 0,235 |
| | Voice | 1,43 | 1,67 | 1,91 | 1,115 | 1,139 | 1,163 | 1,187 | 1,211 | 1,235 |

**Table B-1. Port Card and SCM Mapping for Chassis Slots 1–9 (2 of 2)**

| Ports | VC Type | Chassis Slot Number | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 13 | Data | 0,44 | 0,68 | 0,92 | 0,116 | 0,140 | 0,164 | 0,188 | 0,212 | 0,236 |
| | Voice | 1,44 | 1,68 | 1,92 | 1,116 | 1,140 | 1,164 | 1,188 | 1,212 | 1,236 |
| 14 | Data | 0,45 | 0,69 | 0,93 | 0,117 | 0,141 | 0,165 | 0,189 | 0,213 | 0,237 |
| | Voice | 1,45 | 1,69 | 1,93 | 1,117 | 1,141 | 1,165 | 1,189 | 1,213 | 1,237 |
| 15 | Data | 0,46 | 0,70 | 0,94 | 0,118 | 0,142 | 0,166 | 0,190 | 0,214 | 0,238 |
| | Voice | 1,46 | 1,70 | 1,94 | 1,118 | 1,142 | 1,166 | 1,190 | 1,214 | 1,238 |
| 16 | Data | 0,47 | 0,71 | 0,95 | 0,119 | 0,143 | 0,167 | 0,191 | 0,215 | 0,239 |
| | Voice | 1,47 | 1,71 | 1,95 | 1,119 | 1,143 | 1,167 | 1,191 | 1,215 | 1,239 |
| 17 | Data | 0,48 | 0,72 | 0,96 | 0,120 | 0,144 | 0,168 | 0,192 | 0,216 | 0,240 |
| | Voice | 1,48 | 1,72 | 1,96 | 1,120 | 1,144 | 1,168 | 1,192 | 1,216 | 1,240 |
| 18 | Data | 0,49 | 0,73 | 0,97 | 0,121 | 0,145 | 0,169 | 0,193 | 0,217 | 0,241 |
| | Voice | 1,49 | 1,73 | 1,97 | 1,121 | 1,145 | 1,169 | 1,193 | 1,217 | 1,241 |
| 19 | Data | 0,50 | 0,74 | 0,98 | 0,122 | 0,146 | 0,170 | 0,194 | 0,218 | 0,242 |
| | Voice | 1,50 | 1,74 | 1,98 | 1,122 | 1,146 | 1,170 | 1,194 | 1,218 | 1,242 |
| 20 | Data | 0,51 | 0,75 | 0,99 | 0,123 | 0,147 | 0,171 | 0,195 | 0,219 | 0,243 |
| | Voice | 1,51 | 1,75 | 1,99 | 1,123 | 1,147 | 1,171 | 1,195 | 1,219 | 1,243 |
| 21 | Data | 0,52 | 0,76 | 0,100 | 0,124 | 0,148 | 0,172 | 0,196 | 0,220 | 0,244 |
| | Voice | 1.52 | 1,76 | 1,100 | 1,124 | 1,148 | 1,172 | 1.196 | 1,220 | 1,244 |
| 22 | Data | 0,53 | 0,77 | 0,101 | 0,125 | 0,149 | 0,173 | 0,197 | 0,221 | 0,245 |
| | Voice | 1,53 | 1,77 | 1,101 | 1,125 | 1,149 | 1,173 | 1,197 | 1,221 | 1,245 |
| 23 | Data | 0,54 | 0,78 | 0,102 | 0,126 | 0,150 | 0,174 | 0,198 | 0,222 | 0,246 |
| | Voice | 1,54 | 1,78 | 1,102 | 1,126 | 1,150 | 1,174 | 1,198 | 1,222 | 1,246 |
| 24 | Data | 0,55 | 0,79 | 0,103 | 0,127 | 0,151 | 0,175 | 0,199 | 0,223 | 0,247 |
| | Voice | 1,55 | 1,79 | 1,103 | 1,127 | 1,151 | 1,175 | 1,199 | 1,223 | 1,247 |

**Table B-2. Port Card and SCM Mapping for Chassis Slots 10–18 (1 of 2)**

| Ports | VC Type | Chassis Slot Number | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** |
| 1 | Data | 0,248 | 0,272 | 0,296 | 0,320 | 0,344 | 0,368 | 0,392 | 0,416 | 0,440 |
| | Voice | 1,248 | 1,272 | 1,296 | 1,320 | 1,344 | 1,368 | 1,392 | 1,416 | 1,440 |
| 2 | Data | 0,249 | 0,273 | 0,297 | 0,321 | 0,345 | 0,369 | 0,393 | 0,417 | 0,441 |
| | Voice | 1,249 | 1,273 | 1,297 | 1,321 | 1,345 | 1,369 | 1,393 | 1,417 | 1,441 |
| 3 | Data | 0,250 | 0,274 | 0,298 | 0,322 | 0,346 | 0,370 | 0,394 | 0,418 | 0,442 |
| | Voice | 1,250 | 1,274 | 1,298 | 1,322 | 1,346 | 1,370 | 1,394 | 1,418 | 1,442 |
| 4 | Data | 0,251 | 0,275 | 0,299 | 0,323 | 0,347 | 0,371 | 0,395 | 0,419 | 0,443 |
| | Voice | 1,251 | 1,275 | 1,299 | 1,323 | 1,347 | 1,371 | 1,395 | 1,419 | 1,443 |
| 5 | Data | 0,252 | 0,276 | 0,300 | 0,324 | 0,348 | 0,372 | 0,396 | 0,420 | 0,444 |
| | Voice | 1,252 | 1,276 | 1,300 | 1,324 | 1,348 | 1,372 | 1,396 | 1,420 | 1,444 |
| 6 | Data | 0,253 | 0,277 | 0,301 | 0,325 | 0,349 | 0,373 | 0,397 | 0,421 | 0,445 |
| | Voice | 1,253 | 1,277 | 1,301 | 1,325 | 1,349 | 1,373 | 1,397 | 1,421 | 1,445 |
| 7 | Data | 0,254 | 0,278 | 0,302 | 0,326 | 0,350 | 0,374 | 0,398 | 0,422 | 0,446 |
| | Voice | 1,254 | 1,278 | 1,302 | 1,326 | 1,350 | 1,374 | 1,398 | 1,422 | 1,446 |
| 8 | Data | 0,255 | 0,279 | 0,303 | 0,327 | 0,351 | 0,375 | 0,399 | 0,423 | 0,447 |
| | Voice | 1,255 | 1,279 | 1,303 | 1,327 | 1,351 | 1,375 | 1,399 | 1,423 | 1,447 |
| 9 | Data | 0,256 | 0,280 | 0,304 | 0,328 | 0,352 | 0,376 | 0,400 | 0,424 | 0,448 |
| | Voice | 1,256 | 1,280 | 1,304 | 1,328 | 1,352 | 1,376 | 1,400 | 1,424 | 1,448 |
| 10 | Data | 0,257 | 0,281 | 0,305 | 0,329 | 0,353 | 0,377 | 0,401 | 0,425 | 0,449 |
| | Voice | 1,257 | 1,281 | 1,305 | 1,329 | 1,353 | 1,377 | 1,401 | 1,425 | 1,449 |
| 11 | Data | 0,258 | 0,282 | 0,306 | 0,330 | 0,354 | 0,378 | 0,402 | 0,426 | 0,450 |
| | Voice | 1,258 | 1,282 | 1,306 | 1,330 | 1,354 | 1,378 | 1,402 | 1,426 | 1,450 |
| 12 | Data | 0,259 | 0,283 | 0,307 | 0,331 | 0,355 | 0,379 | 0,403 | 0,427 | 0,451 |
| | Voice | 1,259 | 1,283 | 1,307 | 1,331 | 1,355 | 1,379 | 1,403 | 1,427 | 1,451 |

**Table B-2. Port Card and SCM Mapping for Chassis Slots 10–18 (2 of 2)**

| Ports | VC Type | Chassis Slot Number | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** |
| 13 | Data | 0,260 | 0,284 | 0,308 | 0,332 | 0,356 | 0,380 | 0,404 | 0,428 | 0,452 |
| | Voice | 1,260 | 1,284 | 1,308 | 1,332 | 1,356 | 1,380 | 1,404 | 1,428 | 1,452 |
| 14 | Data | 0,261 | 0,285 | 0,309 | 0,333 | 0,357 | 0,381 | 0,405 | 0,429 | 0,453 |
| | Voice | 1,261 | 1,285 | 1,309 | 1,333 | 1,357 | 1,381 | 1,405 | 1,429 | 1,453 |
| 15 | Data | 0,262 | 0,286 | 0,310 | 0,334 | 0,358 | 0,382 | 0,406 | 0,430 | 0,454 |
| | Voice | 1,262 | 1,286 | 1,310 | 1,334 | 1,358 | 1,382 | 1,406 | 1,430 | 1,454 |
| 16 | Data | 0,263 | 0,287 | 0,311 | 0,335 | 0,359 | 0,383 | 0,407 | 0,431 | 0,455 |
| | Voice | 1,263 | 1,287 | 1,311 | 1,335 | 1,359 | 1,383 | 1,407 | 1,431 | 1,455 |
| 17 | Data | 0,264 | 0,288 | 0,312 | 0,336 | 0,360 | 0,384 | 0,408 | 0,432 | 0,456 |
| | Voice | 1,264 | 1,288 | 1,312 | 1,336 | 1,360 | 1,384 | 1,408 | 1,432 | 1,456 |
| 18 | Data | 0,265 | 0,289 | 0,313 | 0,337 | 0,361 | 0,385 | 0,409 | 0,433 | 0,457 |
| | Voice | 1,265 | 1,289 | 1,313 | 1,337 | 1,361 | 1,385 | 1,409 | 1,433 | 1,457 |
| 19 | Data | 0,266 | 0,290 | 0,314 | 0,338 | 0,362 | 0,386 | 0,410 | 0,434 | 0,458 |
| | Voice | 1,266 | 1,290 | 1,314 | 1,338 | 1,362 | 1,386 | 1,410 | 1,434 | 1,458 |
| 20 | Data | 0,267 | 0,291 | 0,315 | 0,339 | 0,363 | 0,397 | 0,411 | 0,435 | 0,459 |
| | Voice | 1,267 | 1,291 | 1,315 | 1,339 | 1,363 | 1,387 | 1,411 | 1,435 | 1,459 |
| 21 | Data | 0,268 | 0,292 | 0,316 | 0,340 | 0,364 | 0,398 | 0,412 | 0,436 | 0,460 |
| | Voice | 1,268 | 1,292 | 1,316 | 1,340 | 1,364 | 1,398 | 1.412 | 1,436 | 1,460 |
| 22 | Data | 0,269 | 0,293 | 0,317 | 0,341 | 0,365 | 0,399 | 0,413 | 0,437 | 0,461 |
| | Voice | 1,269 | 1,293 | 1,317 | 1,341 | 1,365 | 1,399 | 1,413 | 1,437 | 1,461 |
| 23 | Data | 0,270 | 0,294 | 0,318 | 0,342 | 0,366 | 0,400 | 0,414 | 0,438 | 0,462 |
| | Voice | 1,270 | 1,294 | 1,318 | 1,342 | 1,366 | 1,400 | 1,414 | 1,438 | 1,462 |
| 24 | Data | 0,271 | 0,295 | 0,319 | 0,343 | 0,367 | 0,401 | 0,415 | 0,439 | 0,463 |
| | Voice | 1,271 | 1,295 | 1,319 | 1,343 | 1,367 | 1,401 | 1,415 | 1,439 | 1,463 |

# Glossary

| | |
|---|---|
| **AAL** | ATM Adaptation Layer. The layer above the ATM layer in the logical protocol stack, the AAL translates a higher-layer service format into ATM cells. |
| **AAL-2** | Not entirely specified, this is the ITU-T classification for an ATM Adaptation Layer (AAL) that supports variable bit rate (Class B) data traffic. |
| **AAL-5** | The ITU-T classification for a simplified ATM Adaptation Layer (AAL) that supports connection-oriented, delay-tolerant data traffic. |
| **AIS** | Alarm Indication Signal. A signal transmitted downstream instead of the normal signal to preserve transmission continuity and to indicate to the rest of the network that a fault exists. Also called a Blue Alarm. |
| **alarm** | An abnormal condition affecting communications equipment, usually requiring attention. Major alarms indicate a service disruption; minor alarms are less severe, but are indications of a developing problem. |
| **ATM** | Asynchronous Transfer Mode. A high-speed, low-delay, connection-oriented switching and multiplexing technique using 53-byte cells to transmit different types of data concurrently across a single physical link. |
| **ATM Forum** | An international organization for the promotion and standardization of ATM. |
| **ATM traffic descriptor** | A list of traffic management parameters that characterizes a virtual connection, including Peak Cell Rate (PCR), Sustainable Cell Rate (SCR), and Maximum Burst Size (MBS). |
| **AutoBaud** | A connection algorithm, agreed upon by a consortium of CLECs and manufacturers, for SDSL transceivers using 2B1Q. |
| **CAC** | Connection Admission Control. The set of actions taken to determine whether the connection should be admitted or rejected. |
| **CBR** | Constant Bit Rate. An ATM service category with a guaranteed rate, used for video, voice, and other applications to which timing is critical. |
| **CDV** | Cell Delay Variation. In ATM, differences in cells' transmission times caused by buffering and cell scheduling. Peak-to-peak CDV is a Quality of Service (QoS) delay parameter in CBR and VBR services. |
| **CDVT** | Cell Delay Variation Tolerance. In ATM, the maximum CDV that can be tolerated by the recipient. |
| **cell** | The unit of transmission in ATM. An ATM cell contains a 5-byte header and a 48-byte data payload. |
| **cell header** | Protocol control information used at the ATM layer, providing flow control, addressing, prioritization, and error control. |
| **central office** | CO. The PSTN facility that houses one or more switches serving local telephone subscribers. |
| **checksum** | A value transmitted with a data packet and used by the receiver to assess the fidelity of the data received. It is created by adding the bytes or words of data, ignoring overflow. |
| **CLP** | Cell Loss Priority. A bit in the ATM header that identifies cells that can be discarded during periods of congestion. Cells with a CLP of 1 have lower priority than cells with a CLP of 0. |

| | |
|---|---|
| **CO** | Central Office/Central Site. The PSTN facility that houses one or more switches serving local telephone subscribers. |
| **download** | A process that transfers device firmware and software from a locally attached PC to a device, or allows the duplication of firmware and software from a local device to a remote device. |
| **DSL** | Digital Subscriber Line. The non-loaded, local-loop copper connection between the customer and the first node within the network. |
| **DSLAM** | Digital Subscriber Line Access Multiplexer. A platform for DSL modems that provides high-speed data transmission with POTS over traditional twisted-pair wiring. |
| **DTE** | Data Terminal Equipment. The equipment, such as a computer or terminal, that provides data in the form of digital signals for transmission. |
| **E1** | A wideband digital interface operating at 2.048 Mbps, defined by ITU recommendations G.703 and G.704. It is used primarily outside North America. |
| **E3** | A wideband digital interface operating at 34.368 Mbps. It is used primarily outside North America. |
| **EFCI** | Explicit Forward Congestion Indication. An indicator in the ATM header set by a network entity that has detected congestion or impending congestion. |
| **EPD** | Early Packet Discard. A packet dropping policy for ATM. In EPD, entire packets are dropped when a certain threshold of buffer usage is reached. |
| **GranDSLAM** | A high-density DSLAM supporting a variety of DSL transport types and network services. |
| **HEC** | Header Error Control. In ATM, a CRC byte in the cell header that permits error checking and correction. |
| **IMA** | Inverse Multiplexing for ATM. An ATM Forum specification for sending an ATM cell stream over multiple physical links. |
| **ISP** | Internet Service Provider. A vendor who provides direct access to the Internet. |
| **kbps** | Kilobits per second. One kilobit is usually taken to be 1,024 bits. |
| **LAN** | Local Area Network. A privately owned and administered data communications network limited to a small geographic area. |
| **LED** | Light Emitting Diode. A light or status indicator that glows in response to the presence of a certain condition (e.g., an alarm). |
| **MBS** | Maximum Burst Size. In ATM, the number of cells that may be transmitted at the peak rate without violating the Generic Cell Rate Algorithm (GCRA). |
| **MCP** | Management Communications Processor. The circuit card used to configure and monitor the Hotwire GranDSLAM. |
| **MIB** | Management Information Base. A database of managed objects used by SNMP to provide network management information and device control. |
| **MMF** | MultiMode Fiber optic cable. Fiber optic cable in which light is transmitted over multiple paths. |
| **MPOA** | Multi Protocol Over ATM. |
| **M/SDSL** | Multirate Symmetric Digital Subscriber Line. |
| **nrt-VBR** | Non-real-time Variable Bit Rate. An ATM service category that supports average and peak traffic rate parameters, designed for applications with highly variable traffic. |

| | |
|---|---|
| **OAM** | Operations, Administration, and Maintenance. A group of network management functions in ATM. |
| **OCD** | Out of Cell Delineation. When operating in direct mode, an OCD event is declared if seven consecutive cells have header error control violations. |
| **packet** | A group of control and data characters that are switched as a unit within a communications network. |
| **PCR** | Peak Cell Rate. In ATM, the rate of cell transmission that the source may never exceed. Also known as Maximum Information Rate (MIR). |
| **PDP** | Packet Dropping Policy. A strategy, such as EPD and PPD, for eliminating congestion in ATM and IP networks. |
| **PPD** | Partial Packet Discard. A packet dropping policy for ATM. In PPD, cells in a packet following a cell that must be dropped due to buffer overflow are also dropped. |
| **PVC** | Permanent Virtual Circuit. A connection established administratively. Used in networks supporting frame relay, X.25, and ATM. |
| **QoS** | Quality of Service. In ATM, a level of service dependent on Cell Loss Ratio (CLR), Cell Transfer Delay (CTD), and Cell Delay Variation (CDV). |
| **rt-VBR** | Real-time Variable Bit Rate. An ATM service category that supports average and peak traffic rate parameters, designed for voice applications with a low tolerance for delay and delay variation. |
| **SAR** | Segmentation And Reassembly. The function of breaking apart or reassembling packets, or the entity that provides this function. |
| **SCM** | Shelf Concentration Module. A circuit card that provides connectivity between DSL devices and an ATM uplink. |
| **SCR** | Sustainable Cell Rate. The upper limit of the average rate of an ATM connection. |
| **SDSL** | Symmetric Digital Subscriber Line. A technique for the use of an existing twisted-pair line that permits high bandwidth, bidirectional transmission. |
| **SNMP** | Simple Network Management Protocol. Protocol for open networking management. |
| **UBR** | Unspecified Bit Rate. An ATM service category with no commitment of bandwidth. |
| **UTOPIA** | Universal Test and OPerations Interface for ATM. The electrical interface of sublayers of the ATM physical layer. |
| **VBR** | Variable Bit Rate. An ATM service category that supports average and peak traffic rate parameters. |
| **VC** | Virtual Circuit. A logical connection or packet-switching mechanism established between two devices at the start of transmission. |
| **VCC** | Virtual Channel Connection. A concatenation of Virtual Circuit Links (VCLs) that joins users of the ATM layer. |
| **VCI** | Virtual Channel Identifier. The 16-bit field in an ATM cell header that specifies the virtual channel over which the cell is to be transmitted. |
| **VPI** | Virtual Path Identifier. The 8-bit field in an ATM cell header that specifies the virtual path over which the cell should be routed. |
| **WAN** | Wide Area Network. A network that spans a large geographic area. |
| **xDSL** | A generic term for all varieties of DSL taken as a whole. |

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